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SEPTEMBER 16, 2002 • VOL. 36 • NO. 38 • $5 /COPY

KNOWLEDGE CENTER
NETWORK & SYSTEMS MANAGEMENT

Taking Control

SPECIAL REPORT

Someday, server farms and networks will be self-managing, self-healing and self-learning. But since that won't be happening anytime soon, you need strategies for reasserting control over runaway applications and reining in bandwidth hogs.

STORIES BEGIN ON PAGE 31.

PHILIP ANDERSON

ONLINE EXCLUSIVE

Big-iron inn: Partitions allow a mainframe "hotel" to house multiple OS "guests." Check out the benefits.

QuickLink 32102
www.computerworld.com

WINDOWS XP SLOW TO GAIN FOOTHOLD

Many IT managers hold off on desktop OS, citing costs and recent Win 2k rollouts

BY CAROL SLIWA

Consumers may be buying into Windows XP nn new PCs, but many corporate users are still putting off plans to migrate to Microsoft Corp.'s nearly one-year-old desktop nperating system.

OPERATING SYSTEMS

Even last week's release nf the first service pack of bug fixes for XP — typically a signal for broader corporate adoption of Windows operating systems — was shrugged off by several IT managers.

A *Computerworld* poll of 25 Windows users in a wide range of industries found only four companies that are currently rolling out XP across their operations and four more that plan to start migrations in the coming months. Some users who are holding back on XP cited cost, the lack of a pressing business need and recent Windows 2000 rollouts as factnrs in their decisions.

"We have not moved to XP, and we have no plans to. As far as I am concerned, this is an upgrade that offers nothing to a business customer," said Pat Enright, CIO at Clark Retail Enterprises Inc., a convenience store chain in Oak Brook, Ill.

In particular, users that either have completed Windows 2000 projects or are now rolling it out said they see no reason to jump to Windows XP, which they view as an incremental release over Win 2k.

"The cost is very high to [upgrade], and there's not a lot of perceived value," said Rick Waugh, a technology architect at Telus Corp. in Burnaby, British Columbia.

Jim Cullinan, a lead product manager for Windows, said

Windows XP, page 65

CSC, UTC AT ODDS OVER CONTRACT

Cost issues disputed in big outsourcing deal

BY LUCAS MEARIAN

Computer Sciences Corp. and United Technologies Corp. are discussing a possible renegotiation of their 15-year, $3.7 billion IT outsourcing contract, according to sources who said CSC is trying to get more money in order to cover its costs.

The friction surrounding the talks is causing consternation over the possibility of layoffs for some of the 1,600 CSC employees assigned to UTC, said a CSC technician who is working on the account. Similar concerns have been voiced in postings to a message board on Yahoo Inc.'s Web site.

A CSC spokesman declined to comment in detail. "For the time being, I'd characterize

CSC Contract, page 65

MORE ON OUTSOURCING

For full coverage of IT outsourcing, go to our IT Management Knowledge Center

QuickLink a2290
www.computerworld.com

AIRPORT WLANs LACK SAFEGUARDS

Audit finds wireless LAN systems exposed

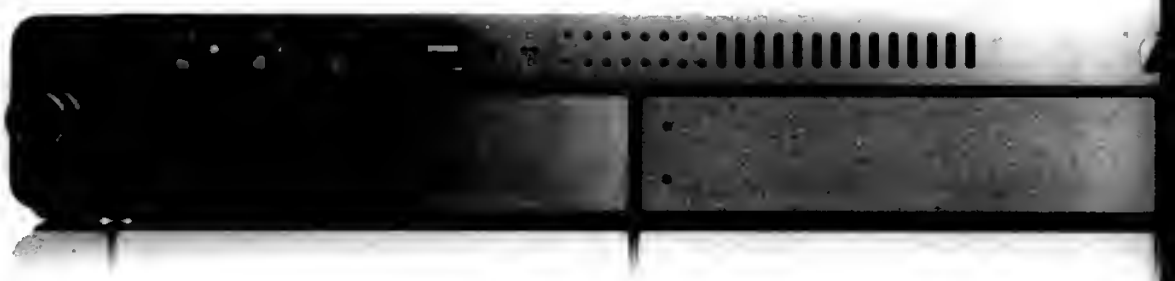
BY BOB BREWIN AND DAN VERTON

While U.S. airlines and airports have beefed up physical security during the past year, wireless LANs continue to be potential IT security problems fnr some airports, according to an informal audit done earlier this month by an executive at a wireless security firm.

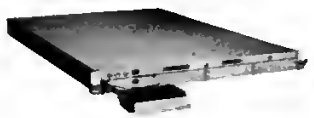
Wireless LANs used at four major airports in applications such as passenger check-in and baggage transfers were operating without even some of the most basic forms of security protections, said Richard Rushing, vice president of technical services at Alpharetta, Ga.-based AirDefense Inc. Rushing

Airport WLANs, page 16

apple.com/xserve



Porsche has a 420-hp, water-cooled,



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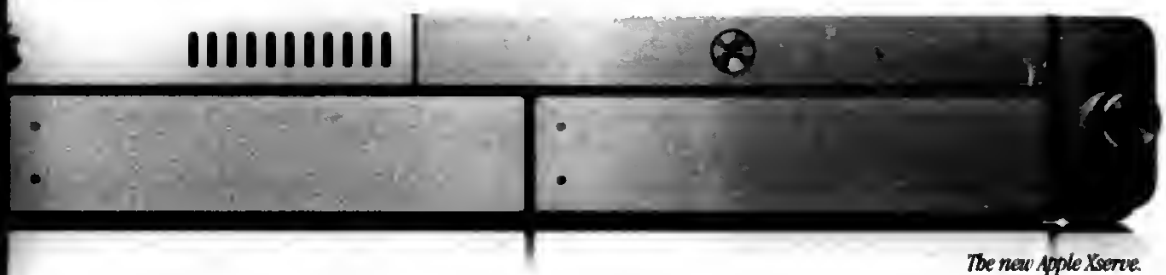
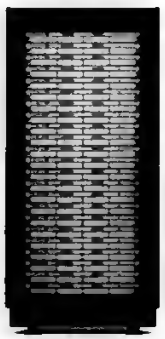


The new Apple Xserve.

twin-turbo power plant. We have this.

to a convenient visual feedback system, you can monitor the performance of an entire rack with just a glance. Or, keep an eye on Xserve from virtually anywhere with Apple's next-generation remote management tools. Plus, you can swap parts and replace components at will without tools and get instant help with 4-hour onsite response and 24/7 technical support with AppleCare.* Xserve also provides out-of-the-box support for Mac, Windows, UNIX and Linux clients, three PCI slots (two of which are 64-bit, 66MHz), software RAID mirroring and striping, a VGA graphics card, two USB ports and a host of other features that are far too numerous to list here. Apple Xserve. Take a look under the hood at apple.com/xserve.



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SEPTEMBER 16, 2002

COMPUTERWORLD THIS WEEK

NEWS 6

6 Sun Microsystems this week will announce technology for allocating system resources to different applications as needed.

7 Intel is working on a pair of initiatives aimed at building IT security capabilities into its microprocessors.

7 The U.S. General Accounting Office will try to assess the impact of H-1B visas on U.S. workers, but doing so may not be easy.

10 The Nimda worm, which was let loose a year ago this week, taught IT managers a lot of security lessons.

12 Computer Associates is announcing a security management console but won't ship the software until early next year.

OPINIONS

ONLINE

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KNOWLEDGE CENTER
NETWORK & SYSTEMS MANAGEMENT

SPECIAL REPORT

Taking Control

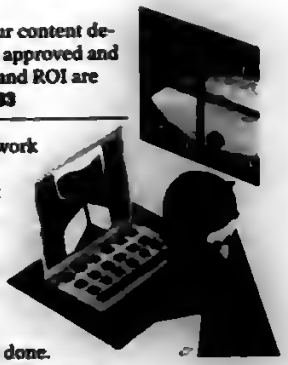
It will be nice when networks and systems are self-managed, self-healing — self-everything. Until then, here's a special report that describes the latest strategies for improving the performance of corporate networks and systems to meet growing business demands. **PACKAGE BEGINS ON PAGE 31.**

32 The Story So Far The first IT headache was burned-out vacuum tubes. Now it's bandwidth hogs. Here's a fast-paced tour of the history of network and systems administration.

36 Coping With Bandwidth Hogs Just buying more bandwidth doesn't unclog every bottleneck in network traffic, nor does it work for constrained corporate pocketbooks. IT managers are finding new ways to use the tools at hand to curb their networks' bandwidth thirst.
ONLINE: Charging departments for their network usage, a controversial method for controlling bandwidth demand, may be in many companies' futures. **QuickLink 32151**

36 ROI: Finding and mapping your network connections can help ensure uptime, but it can be a costly endeavor when conducted manually or with tools that require too much human intervention. Automation tools can help.
ONLINE: When network problems occur, automated notification can help resolve a problem before the help desk phone starts ringing.
QuickLink 32050

40 Speedy Deliveries Q&A: Scot Hull, who's built many content delivery networks and written a book on the subject, identifies the technologies involved and the "gotchas" for IT managers.
ONLINE: How to get your content delivery network project approved and funded. Hint: Metrics and ROI are required. **QuickLink 32033**



46 Field Report: Network and systems management tools can predict and prevent potential problems before they affect end users. Here's why most IT staffs rely on a mix of tools, rather than one product, to get the job done.
ONLINE: NSM tools provide a hierarchy of information that's suited to different audiences, from network engineers to CIOs. **QuickLink 32586**

48 QuickStudy: The most common mechanism for keeping tabs on network health is the Simple Network Management Protocol (SNMP). Here's how it works.

50 See What Users Really See Application performance management (APM) tools can help IT managers monitor the experiences end users have with systems and Web sites — and then fix the bugs or bottlenecks. But end-to-end visibility remains elusive.
ONLINE: One of the better-known Internet businesses is relying on APM technology to keep transactions moving along smoothly and keep customers happy. Read this online story to find out how. **QuickLink 31702**

54 Careers: A roundup of skills, training and salary information for network administrators.
ONLINE: Jack-of-all-trades and master of none? IT managers offer advice on specialization vs. cross-training in the network field. **QuickLink 32120**

56 The Next Chapter Pundits predict that Web services will be the next management nightmare. But at least administrators will be able to manage corporate networks by PDA.
ONLINE: Is SNMP doomed? Will instant messaging become the biggest traffic type on corporate networks? More predictions online. **QuickLink 32043**

ILLUSTRATIONS BY PHILIP ANDERSON

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THE BIG-IRON INN

Partitions allow a single mainframe to house multiple operating system "guests." There are three approaches to mainframe partitioning — see which one matches your needs.
QuickLink 32102

FEARLESS UPGRADES

With mission-critical business functions on the line, playing out network upgrade scenarios in a protected area before going live can give IT managers peace of mind.
QuickLink 32056

CASE STUDIES

A group of hotels outsources network management. An e-learning company gets a 46% boost in server throughput. And an online gaming company finds a low-cost network monitoring tool that meets its needs. **QuickLink 32043**

AT DEADLINE

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Lucent Technologies Inc. warned that revenue in its fiscal fourth quarter will be much lower than predicted due to a continuing decline in spending by telecommunications companies. Murray Hill, N.J.-based Lucent said business in Q4, which ends this month, will be down by as much as 25% compared with the $2.95 billion the company reported for its third quarter.

PwC Partners OK Consulting Unit Sale

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Sun Aims to Cut Data Center Complexity

Will unveil 'N1' strategy for better resource planning, use at SunNetwork conference

BY JAIKUMAR VIJAYAN

SUN MICROSYSTEMS Inc. this week plans to announce details of an ambitious initiative, informally called N1, that's aimed at helping companies better utilize their data center computing resources while reducing systems management complexity.

SYSTEMS MANAGEMENT

At its SunNetwork 2002 user conference in San Francisco, the company will also disclose details about an emerging desktop Linux initiative and new IT security software. But N1 is one of the top priorities on the SunNetwork agenda, according to company officials.

N1 is Sun's code name for a set of software and hardware that's aimed at giving IT managers the ability to dynamically allocate hardware, software, storage and network technologies to support distributed applications, or services, as Sun is now calling them.

"The idea is that N1 will match an application, or service, with the correct resources that will optimally handle that workload," said Tony Iams, an analyst at D.H. Brown Associates Inc. in Port Chester, N.Y.

Instead of permanently tying an application to a specific set of equipment, the N1 offering is designed to let users shift resources as processing needs fluctuate, Iams said. IT managers will also be able to set resource usage prioritization policies to govern the allocation process, he added.

Old and New

Much of Sun's existing technology — including its Unix servers, the Solaris operating system, Java and the Sun Open Net Environment software suite — will be used as part of the N1 strategy, Iams said. For example, Solaris 9 already features an N1-like resource management capability.

But Sun will also roll out a series of new N1-related products and services, starting at this week's conference, said Yael Zhent, a senior director at Sun. She declined to provide details about the products but said that Sun's goal is to support far better utilization of data center resources.

"A theme we have consistently heard from our customers is that the data center is not running efficiently because there is not a whole lot of resource-sharing going on," Zhent said, adding that IT resource utilization rates often "are far from perfect."

Another aim of the N1 initiative is to give administrators a much more service-oriented, cross-platform view of their technology infrastructures, as opposed to managing specific hardware or components individually, Zhent said.

The 4,000 or so attendees expected at the conference will also see Sun follow through on promises to announce client-level plans for supporting Linux, said David Head, the executive in charge of organizing SunNetwork. Sun CEO Scott McNealy said at last month's LinuxWorld Conference & Expo that a desktop Linux move was in the works [QuickLink 32130].

First InfiniBand Switch Hits the Market

Despite product pullouts by Microsoft and Intel, InfiniBand potential remains strong

BY LUCAS MEARIAN

The industry's first switch that supports InfiniBand technology, which is aimed at reducing the complexity of server clustering and increasing I/O throughput speeds, began shipping today.

InfiniCon Systems Inc.'s InfinIO 7000 Shared I/O System is a 10G bit/sec. switch that lets servers communicate directly with one another. The switch is aimed at reducing external connections in high-availability server clusters by up to 50%.

"The shared I/O focus is a good way to encourage the market to start [using InfiniBand]," said Arun Taneja, an analyst at Enterprise Storage Group Inc. in Milford, Mass. "The question is, are enough pieces in place?"

Complete InfiniBand architectures would include switches, host bus adapters (HBA) and software. Vendors that are working on InfiniBand software due for release early next year include VIEO Inc. and Lanel5 Software Inc. HBA vendors such as JNI Corp. and Mellanox Technologies Inc. also have products in the pipeline.

The InfinIO 7000 switch lets servers connect into a single high-speed InfiniBand link and integrate with existing Fibre Channel and Ethernet networks. Chuck Foley, CEO of King of Prussia, Pa.-based InfiniCon, said the switch removes the need for Fibre Channel HBAs and Ethernet network interface cards.

InfinIO consists of dual 10G bit/sec. InfiniBand 4X switch modules and up to eight plug-and-play I/O modules supporting Gigabit Ethernet, 2G bit Fibre Channel and 10G bit InfiniBand expansion cards. Chassis slots can be populated with any mix of the modules and hot-swapped as needed.

List prices for the switch run from $26,740 to $84,320.

Intel Corp. and Microsoft Corp. recently announced that they were stopping development work related to the emerging server I/O technology. Intel dropped its plans for InfiniBand-related chips in May, while Microsoft last month said it no longer plans to build InfiniBand management capabilities into the upcoming Windows .Net Server 2003 operating system [QuickLink 31869].

But Taneja said he's still confident that InfiniBand will become a data center fixture within the next couple years. Dell Computer Corp., IBM and Sun Microsystems Inc. are still solidly behind InfiniBand, he noted, adding, "Those are the players who are going to make InfiniBand a volume technology."

STORAGE DOWNLOAD

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Intel Pushes for Hardware-Based Security

Microprocessors to get built-in protection

BY DAN VERTON

Intel Corp., the world's largest manufacturer of microprocessors, last week announced two new security initiatives that aim to put more of the burden for improved IT security on hardware, in contrast to the current practice of relying almost exclusively on software.

Speaking at the Fall 2002 Intel Developer Forum in San Jose, Intel President Paul Otellini said the company plans to integrate a new core security technology into all of its future processors. Known as LaGrande Technology (LT), the hardware-based approach would improve security for corporate users by enabling protected execution, memory and storage, Otellini said.

The LT announcement was followed by news of another hardware-based security initiative by Intel that aims to improve authentication capabilities for mobile laptop users. Otellini said that Intel has signed an agreement with VeriSign Inc., a vendor of digital certificate technology in Mountain View, Calif., to provide authentication options that notebook computer makers can incorporate into their business-class machines.

Added Security

The new line of Intel Banias mobile processors, which is expected to be released in the first half of next year, will be optimized to work with a separate Trusted Platform Module (TPM) on the notebook's motherboard. The TPM is a hardware security controller that contains a microprocessor and memory, where a user's private-key security information can be stored.

The idea, said Ed Kim, a product manager at VeriSign, is that corporate computing can be made more secure through hardware user authentication. The TPM will work with VeriSign's digital certificates and authentication software.

"Adding in a hardware protection layer seems like the right way to go, as long as it doesn't block or impede the software enhancements that need to be done," said Steven Sommer, CIO at New York-based law firm Hughes Hubbard & Reed LLP. "Until this point, most of the software protection that has been built has not been up to snuff."

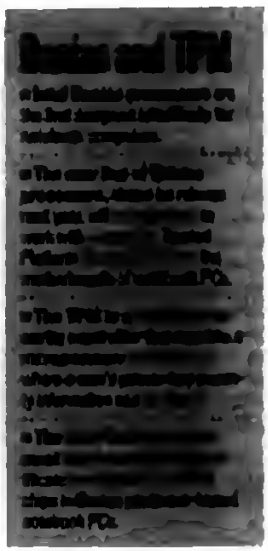
The focus on hardware-based security is "definitely a good thing," said Charles Kolodgy, an analyst at IDC in Framingham, Mass. "Hardware-based security raises the barrier for hackers and crackers."

Mandy Andress, president of ArcSec Technologies Inc., a consultancy in Dublin, Calif., said that while she considers both Intel moves to be steps in the right direction, they will work only if developed properly. "If not designed well and thoroughly tested, this secure chip might end up only providing a false sense of security," she said.

Software vendors are currently working with hardware makers to ensure that their efforts don't work against each other, said Kolodgy. And that's a critical factor for users like Sommer.

"It would be the best of all possible worlds if [the software and hardware vendors] are able to work together and shield us out of harm's way," he said. "I just don't want them to end up jousting with each other if and when a problem arises."

Computerworld's Todd R. Weiss contributed to this report.



Correction

The name of Sprint Corp.'s director of data product management, Barry Tishgart, was misspelled in the story "Mutual Not-World-Interop Looms Major Problem" in our Sept. 9 issue.

Feds to Study H-1B Program's Impact on IT Hiring, Retention

GAO seeks data on how visas affect jobs of U.S. workers

BY PATRICK THIBODEAU

There's no shortage of anecdotal reports from U.S. workers that the H-1B visa program is costing Americans jobs. But proof of that has been elusive because companies aren't required to tell the government about the employees they hire or lay off.

That's a problem facing the U.S. General Accounting Office as it embarks on a study aimed at answering a pair of questions posed by two members of the U.S. House Science Committee: Do companies show a preference for retaining H-1B workers over U.S. citizens when they cut jobs? And if so, why?

The GAO study, due out sometime next year, is expected to arrive in the midst of a congressional debate over whether the annual cap on the controversial program should shrink from its current level of 195,000 visas to 65,000 after the federal government's next fiscal year ends on Sept. 30, 2003.

Critics of the H-1B program charge that in many cases, foreign workers are hired for lower wages and fewer benefits than U.S. citizens would typically receive. But industry groups counter that H-1B holders, who can work in the U.S. for six years and possibly longer, are needed because the U.S. doesn't supply enough workers with technical skills.

U.S. Reps. James Barcia and Lynn Rivers, both of whom are Michigan Democrats and Science Committee members, requested the GAO study a year ago. The GAO divided the request into two parts, starting with a look at the effectiveness of a training program that has been funded through H-1B fees. That report is due in a matter of weeks (see box).

Formulating a Plan

The GAO has yet to determine how to research the H-1B program's impact on IT hiring and retention. Agency officials will soon meet with House Science Committee staff members to discuss a research methodology, according to GAO and committee staffers.

However, the plan is already drawing criticism from Harris Miller, an H-1B advocate who heads the Information Technology Association of America in Arlington, Va. Miller said the latest H-1B usage data is proof enough that the program isn't being abused.

The U.S. Immigration and Naturalization Service recently reported that it granted 60,500 H-1B visas in the nine-month period that ended June 30, representing a 54% drop from the same period during the previous fiscal year.

"The numbers speak for themselves," Miller said, adding that the drop-off shows that H-1B critics are wrong about the visa program serving as a supply of cheap labor for U.S. companies. "If they were right, which they are not, there would be just as many H-1Bs today as a year ago."

But George McClure, who chairs the career policy committee of the New York-based Institute of Electrical and Electronics Engineers - USA Inc. (IEEE), pointed to rising unemployment numbers for computer and electronics engineers, as well as reports from IEEE members who say they have lost jobs to H-1B workers.

"We've got lots of unemployed members . . . who can do the jobs that they are bringing in H-1Bs for," McClure said. He added that he has heard from engineers who were ordered to train H-1B visa holders and then laid off by their employers. The GAO needs to talk to some of those affected workers, McClure said.

AT A GLANCE

Fight Over H-1B Training

THE ISSUE: Part of the fees that employers pay to take part in the H-1B visa program are set aside for training U.S. citizens, in an **effort to reduce the need for hiring H-1B workers**

THE WHITE HOUSE'S VIEW: Bush administration officials **call the $138 million training program ineffective** and say it's mainly being used to train cable installers and other low-tech workers.

CONGRESS'S INPUT: The GAO will soon **release a report that's expected to find some merit** in the training program, such as the development of localized training designed to meet the needs of employers in specific areas.

SPECIAL FOCUS

For full coverage of H-1B issues, head to our Focus on H-1B Visas page.

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AT DEADLINE

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High-Speed Link

InfiniCon Systems' InfinIO 7000 Shared I/O System

- Provides a 10G bit/sec. InfiniBand 4X switch
- Permits servers to communicate directly and is up to 10 times faster than current networks
- Reduces external connections in high-availability server clusters by as much as 50%

List prices for the switch run from $26,740 to $84,320.

Intel Corp. and Microsoft Corp. recently announced that they were stopping development work related to the emerging server I/O technology. Intel dropped its plans for InfiniBand-related chips in May, while Microsoft last month said it no longer plans to build InfiniBand management capabilities into the upcoming Windows .Net Server 2003 operating system [QuickLink 31869].

But Taneja said he's still confident that InfiniBand will become a data center fixture within the next couple years. Dell Computer Corp., IBM and Sun Microsystems Inc. are still solidly behind InfiniBand, he noted, adding, "Those are the players who are going to make InfiniBand a volume technology."

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Intel Pushes for Hardware-Based Security

Microprocessors to get built-in protection

BY DAN VERTON

Intel Corp., the world's largest manufacturer of microprocessors, last week announced two new security initiatives that aim to put more of the burden for improved IT security on hardware, in contrast to the current practice of relying almost exclusively on software.

Speaking at the Fall 2002 Intel Developer Forum in San Jose, Intel President Paul Otellini said the company plans to integrate a new core security technology into all of its future processors. Known as LaGrande Technology (LT), the hardware-based approach would improve security for corporate users by enabling protected execution, memory and storage, Otellini said.

The LT announcement was followed by news of another hardware-based security initiative by Intel that aims to improve authentication capabilities for mobile laptop users. Otellini said that Intel has signed an agreement with VeriSign Inc., a vendor of digital certificate technology in Mountain View, Calif., to provide authentication options that notebook computer makers can incorporate into their business-class machines.

Added Security

The new line of Intel Banias mobile processors, which is expected to be released in the first half of next year, will be optimized to work with a separate Trusted Platform Module (TPM) on the notebook's motherboard. The TPM is a hardware security controller that contains a microprocessor and memory, where a user's private-key security information can be stored.

The idea, said Ed Kim, a product manager at VeriSign, is that corporate computing can be made more secure through hardware user authentication. The TPM will work with VeriSign's digital certificates and authentication software.

"Adding in a hardware protection layer seems like the right way to go, as long as it doesn't block or impede the software enhancements that need to be done," said Steven Sommer, CIO at New York-based law firm Hughes Hubbard & Reed LLP. "Until this point, most of the software protection that has been built has not been up to snuff."

The focus on hardware-based security is "definitely a good thing," said Charles Kolodgy, an analyst at IDC in Framingham, Mass. "Hardware-based security raises the barrier for hackers and crackers."

Mandy Andress, president of ArcSec Technologies Inc., a consultancy in Dublin, Calif., said that while she considers both Intel moves to be steps in the right direction, they will work only if developed properly. "If not designed well and thoroughly tested, this secure chip might end up only providing a false sense of security," she said.

Software vendors are currently working with hardware makers to ensure that their efforts don't work against each other, said Kolodgy. And that's a critical factor for users like Sommer.

"It would be the best of all possible worlds if [the software and hardware vendors] are able to work together and shield us out of harm's way," he said. "I just don't want them to end up jousting with each other if and when a problem arises."

Computerworld's Todd R. Weiss contributed to this report.

Banias and TPM

- **Intel Banias processors** are the first designed specifically for notebook computers.
- **The new line of Banias processors,** slated for release next year, will be optimized to work with a separate Trusted Platform Module (TPM) on the motherboards of notebook PCs.
- **The TPM is a hardware security controller** that contains a microprocessor and memory, where a user's private-key security information can be stored.
- **The Intel/VeriSign agreement incorporates** digital certificate functionality into TPM chips in Banias processor-based notebook PCs.

Correction

The name of Sprint Corp.'s director of data product management, Barry Tishgart, was misspelled in the story "Muted NetWorld+Interop Lacks Major Rollouts" in our Sept. 9 issue.

Feds to Study H-1B Program's Impact on IT Hiring, Retention

GAO seeks data on how visas affect jobs of U.S. workers

BY PATRICK THIBODEAU

There's no shortage of anecdotal reports from U.S. workers that the H-1B visa program is costing Americans jobs. But proof of that has been elusive because companies aren't required to tell the government about the employees they hire or lay off.

That's a problem facing the U.S. General Accounting Office as it embarks on a study aimed at answering a pair of questions posed by two members of the U.S. House Science Committee: Do companies show a preference for retaining H-1B workers over U.S. citizens when they cut jobs? And if so, why?

The GAO study, due out sometime next year, is expected to arrive in the midst of a congressional debate over whether the annual cap on the controversial program should shrink from its current level of 195,000 visas to 65,000 after the federal government's next fiscal year ends on Sept. 30, 2003.

Critics of the H-1B program charge that in many cases, foreign workers are hired for lower wages and fewer benefits than U.S. citizens would typically receive. But industry groups counter that H-1B holders, who can work in the U.S. for six years and possibly longer, are needed because the U.S. doesn't supply enough workers with technical skills.

U.S. Reps. James Barcia and Lynn Rivers, both of whom are Michigan Democrats and Science Committee members, requested the GAO study a year ago. The GAO divided the request into two parts, starting with a look at the effectiveness of a training program that has been funded through H-1B fees. That report is due in a matter of weeks (see box).

Formulating a Plan

The GAO has yet to determine how to research the H-1B program's impact on IT hiring and retention. Agency officials will soon meet with House Science Committee staff members to discuss a research methodology, according to GAO and committee staffers.

However, the plan is already drawing criticism from Harris Miller, an H-1B advocate who heads the Information Technology Association of America in Arlington, Va. Miller said the latest H-1B usage data is proof enough that the program isn't being abused.

The U.S. Immigration and Naturalization Service recently reported that it granted 60,500 H-1B visas in the nine-month period that ended June 30, representing a 54% drop from the same period during the previous fiscal year.

"The numbers speak for themselves," Miller said, adding that the drop-off shows that H-1B critics are wrong about the visa program serving as a supply of cheap labor for U.S. companies. "If they were right, which they are not, there would be just as many H-1Bs today as a year ago."

But George McClure, who chairs the career policy committee of the New York-based Institute of Electrical and Electronics Engineers - USA Inc. (IEEE), pointed to rising unemployment numbers for computer and electronics engineers, as well as reports from IEEE members who say they have lost jobs to H-1B workers.

"We've got lots of unemployed members . . . who can do the jobs that they are bringing in H-1Bs for," McClure said. He added that he has heard from engineers who were ordered to train H-1B visa holders and then laid off by their employers. The GAO needs to talk to some of those affected workers, McClure said.

AT A GLANCE

Fight Over H-1B Training

THE ISSUE: Part of the fees that employers pay to take part in the H-1B visa program are set aside for training U.S. citizens in an **effort to reduce the need for hiring H-1B workers.**

THE WHITE HOUSE'S VIEW: Bush administration officials **call the $138 million training program ineffective** and say it's mainly being used to train cable installers and other low-tech workers.

CONGRESS'S INPUT: The GAO will soon **release a report that's expected to find some merit** in the training program, such as the development of localized training designed to meet the needs of employers in specific areas.

SPECIAL FOCUS

For full coverage of H-1B issues, head to our Focus on H-1B Visas page.

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BRIEFS

Sun Speeds Up Low-End Servers

Sun Microsystems Inc. has added more-powerful processors to two of its low-end Unix servers. Its single-processor Sun Fire V100 system will now ship with either a 550- or 650-MHz UltraSPARC IIi chip, boosting performance by up to 30%. The dual-CPU Sun Fire 280R is getting a 1.015-GHz UltraSPARC III chip that will increase its power by up to 17%, Sun said.

HP, Hitachi Agree to Swap Storage APIs

Hewlett-Packard Co. and Hitachi Ltd. announced a deal under which the two will exchange the application programming interfaces (API) for their disk storage product lines. HP and Hitachi said the API swap will enable their respective storage management software products to manage each other's disk arrays. HP signed similar deals with EMC Corp. and IBM this summer.

NCR Names Chief Operating Officer

NCR Corp. appointed Mark Hurd its chief operating officer, with responsibility for all of its technology and services units. Hurd previously held the title of NCR president jointly with Howard Lance while running the Dayton, Ohio-based company's Teradata data warehousing division. NCR said Lance, who was in charge of its retail and financial systems group, is leaving the company.

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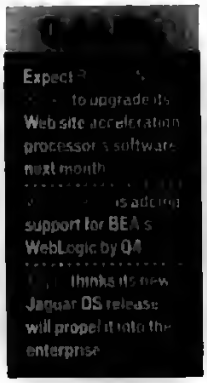
Web Services Lovefest Persists Despite . . .

. . . major concerns with security, component compatibility and how long IBM and Microsoft can remain strange bedfellows. Take Web services tool maker Systinet Corp. in Cambridge, Mass. It worries that most **developers leave security to the transport layer**, or SSL, when "security should be in the application logic layer," says company Senior Director Charlie Ungashick. Accordingly, Systinet will release this week its 4.0.1 versions of WASP Developer for Eclipse and WASP Developer for JBuilder, which adhere to specifications in the recently published Web Services Security draft proposal (*www-106.ibm.com/developerworks/library/ws-secure*). ■ If security concerns don't dampen your ardor for Web services, perhaps the **compatibility problems** raised by Scott Hunter, executive vice president for engineering at Santa Ana, Calif.-based Starbase Corp., will give you pause. "Web services applications are being built from typical RPC-like services, and as sooo as you add a new parameter, it breaks," he claims. This is particularly a problem for developers who use tool wizards to turn old code into Web services, he adds. ■ A few observers wooder how long IBM and Microsoft can avoid smacking each other around over Web services. Jeffrey Howard, senior product manager at **Rational Software Inc.** in Cupertino, Calif., a close partner of both companies, acknowledges that if the two companies don't complete their open standards work in progress, Web services may become just as incompatible as COM+ and CORBA. Tom Welsh, a Web services analyst at **Cutter Consortium sums it up**: "It would be a mistake to think that Web services are as well established as CORBA." ■ But that's not slowing vendors one bit. Annrai O'Toole, CEO of Cape Clear Software Inc. in San Mateo, Calif., says that next month, his company will unveil its 4.0 versioo of **Cape-Studio**, which will include enterprise-class features for improved security, guaranteed message delivery and services fail-over and recovery. ■ Hot on its heels will be BEA Systems Inc. in San Jose, says company Vice President Byroo Sebastian. The next release of its suite uf Web services developer tools will include support for security enhancements such as authentication and digital signatures, as well as a way to establish **reliable messaging between Web services applications.** ■ Beyond the ever-widening world of Web services, vendors do exist. Although sometimes you wonder why. After all, if blue-chip companies such as Nortel and Lucent are imploding in large measure because of overcapacity, why would a start-up iike **Force10 Networks Inc.** think the market is going to embrace its new line of 1.2T bit/sec. capacity switch/routers? So convinced is it that early next year, it will add a four-port card, which will cut the per-port cost of its current $55,000 single-port offering. But who's going to buy? Well, in addition to R&D efforts like the National Scieoce Foundation-funded TeraGrid data mining project, there are 2,000 potential corporate users, says Steve Mullaney, marketing vice president at the Milpitas, Calif.-based company. And he says that he knows each and every one of them. **Expect a call.** ■ Innova Solutions io Santa Clara, Calif., has targeted the financial services market with a new product that's expecied to be named **STP Collaborator.** It will handle exception reporting for the impending SEC-mandated straight-through processing of equities trades. If Innova can nail that problem, said to be the biggest drawback to meeting the SEC rules, it'll have CIOs of financial companies flocking its way. ■ Giving users **remote access to their PCs** got way easier with Santa-Barbara, Calif.-based Expertcity Inc.'s iotroduetion this week of GoToMyPC Corporate, wbich gives systems admins simple tools to set up and manage remote access accounts in a secure environment. Even a journalist can du it. ●



Wal-Mart Chooses Internet Protocol for Data Exchange

Says supplier costs will drop with AS2

BY MATT HAMBLEN

Wal-Mart Stores Inc. announced last week that it has chosen an Internet-based protocol fur electronic data exchange with thousands of its national and global suppliers.

Wal-Mart said that the use of the new Electronic Data Interchange-Internet Integration Applicability Statemeot 2 (EDIINT AS2) protocol is expected to lower costs for the company and its suppliers, although one analyst said that might not be the case.

Bentonville, Ark.-based Wal-Mart picked the Commerce Suite developed by Dallas-based iSoft Corp. The software supports the AS2 protucol, which was approved by the Internet Engineering Task Force last year. Wal-Mart said its choice of AS2 means that suppliers won't need to resort to deploying value-added networks (VAN).

Under the agreement, iSoft will install server software at Wal-Mart's headquarters aod offer elient software to Wal-Mart suppliers for unly a $300 annual maintenance fee, iSoft CEO Christian Putnam said.

Suppliers aren't required to purchase the iSoft client and ean use AS2 software from one uf several other vendors, Putnam said. He added that the AS2 approach will replace Wal-Mart's reliance on dial-up modems for ordering goods.

"It's a huge step in performance," Putnam said.

Ken Vollmer, an analyst at Giga Infnrmation Group Inc. in Cambridge, Mass., said that if a supplier has just a few data connections or links to only Wal-Mart, the AS2 client would make sense. But a large number of connections would be better handled by a VAN, he said.

AS2 and several other EDI-INT protocols haven't caught on as expected and account for less than 10% of total EDI traffic, far below tbe 40% level projected three years ago for 2002, Vollmer said. The vast majority of EDI traffic is still handled by VANs, partly beeause EDIINT doesn't scale well enough, he added. ●

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MARK HALL ■ ON THE MARK

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Feds Considering Terrorism Liability Protections for Vendors

Critics of congressional proposals fear that lower-quality products may result

BY PATRICK THIBODEAU
WASHINGTON

CONGRESS IS moving closer to limiting the liability of IT vendors that sell to federal, state and local governments by allowing Uncle Sam to insure systems that fail to stop terrorists from causing havoc.

The latest effort to limit vendor liability came in legislation introduced last week by two top Republicans, offered as an amendment to the Senate's version of a bill authorizing the creation of a federal Department of Homeland Security.

If approved, the amendment would pave the way for the federal government to pay liability damages beyond what private insurance covers for companies that the president designates as makers of products related to national security. The House is taking another approach to liability in its version of the homeland security bill, and the differences would have to be reconciled in the final measure (see box).

But critics of the Senate amendment warned that if the liability protections are too broad and include commercial software that's in wide use, corporate users may ultimately pay a price in the form of lower-quality products and tougher contract negotiations.

The legislation is also stirring new debate on a long-standing and contentious issue: Would software quality improve if vendors were held liable for vulnerabilities?

Leon Kappleman, director of the Information Systems Research Center at the University of North Texas in Denton, said he sees a big risk to the Senate's liability proposal.

"It's Congress that says we must have more secure systems, and now they're going to be the insurance company for the vendors, too? It's a dangerous place to be," he said.

But David Colton, a vice president at the Information Technology Association of America, said the legislation is needed to protect vendors from the efforts of terrorists to break into and misuse IT systems at government agencies.

Colton said the Senate proposal isn't an attempt by vendors to avoid standing behind their products. "We're just facing an active combatant working hard to defeat us," he said.

The amendment wouldn't directly affect commercial contracts, but legal experts said it could still impact corporate users. Vendors might use a federal indemnification status to argue for liability limits on private-sector contracts, said Christopher Wolf, an attorney at law firm Proskauer Rose LLP's Washington office.

For decades, the U.S. government has provided indemnification for vendors of high-risk products, such as those used by the space program and by the military. But the proposed homeland security amendment would broaden the president's indemnification powers.

If liability protections were extended to products such as firewalls and routers, "that would be a horrible thing," said Jerry Brady, chief technology officer at security software vendor Guardent Inc. in Waltham, Mass. "That would certainly reduce the last bit of reasoning for producing quality products in that space," he said.

Congressional Paths Diverging

Homeland security bills in the House and Senate propose different kinds of liability protections for IT vendors.

- **SENATE VERSION:** Bill includes a tort reform approach that would limit liability suits to federal courts and cap damages at the amount of insurance held by a vendor.
- **HOUSE VERSION:** New amendment would let vendors that sell to government agencies be indemnified against damage awards that go beyond their insurance coverage.

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QuickLink s1300
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Nimda Worm Biggest Driver Of Security Over Past Year

Prompted stricter IT safety moves than 9/11 attacks

BY JAIKUMAR VIJAYAN

This week marks the first anniversary of the Nimda virus attack, an event that may have driven more corporate IT security changes during the past 12 months than the Sept. 11 terrorist attacks did.

Nimda first surfaced on Sept. 18 last year and was among the first major viruses to target both servers and client computers. It combined features from previous threats and propagated not just via e-mail attachments, but also through shared files on servers. It also exploited Web pages containing Java scripts.

"Nimda heightened awareness, unfortunately at a very high cost," said Kim Milford, information security manager at the University of Wisconsin-Madison. For example, the virus showed that "filtering at the e-mail gateway or on the desktop alone wasn't the Holy Grail that we security folks are always seeking," Milford said.

Among other things, the worm was capable of modifying certain types of Web documents, providing hackers with administrative access to systems and creating back doors on infected systems that future attackers could exploit. It spread much faster and was quicker to cause damage than any previous worm or virus. According to antivirus vendor Symantec Corp., there are more than 35,000 Nimda-related attacks occurring every day on corporate networks.

Nimda demonstrated the need for multiple layers of security more than any previous threat, said James M. Rinkel, senior vice president of systems services at Nova Information Services Inc., a credit card processing firm in Atlanta.

One result is that companies have been forced to focus not only on network and perimeter security, but also on application- and database-level security, which Nova had been doing even prior to Nimda, Rinkel said. "It's also become crucial to have a plan to try and quarantine a virus if it gets into your systems, to keep it from spreading throughout the corporation," he said.

After Nimda struck, the University of Chicago got stricter about removing improperly secured machines from its network, said E. Larry Lidz, a senior network security officer at the school.

"Before Nimda, we would alert the administrator of the machines that they were vulnerable to a security hole, but unless we had evidence that a machine was actually compromised, we generally left it on the network," Lidz said.

He added that the university has also implemented a new process aimed at helping systems administrators install patches as soon as possible after security vulnerabilities are discovered in software that's widely used on its network.

"Nimda attacked the core content and data of enterprises," said Diane Fraiman, a vice president at Sanctum Inc., a security software vendor in Santa Clara, Calif. "It brought home the fact that security is ont just about network-level security or about authentication and authorization."

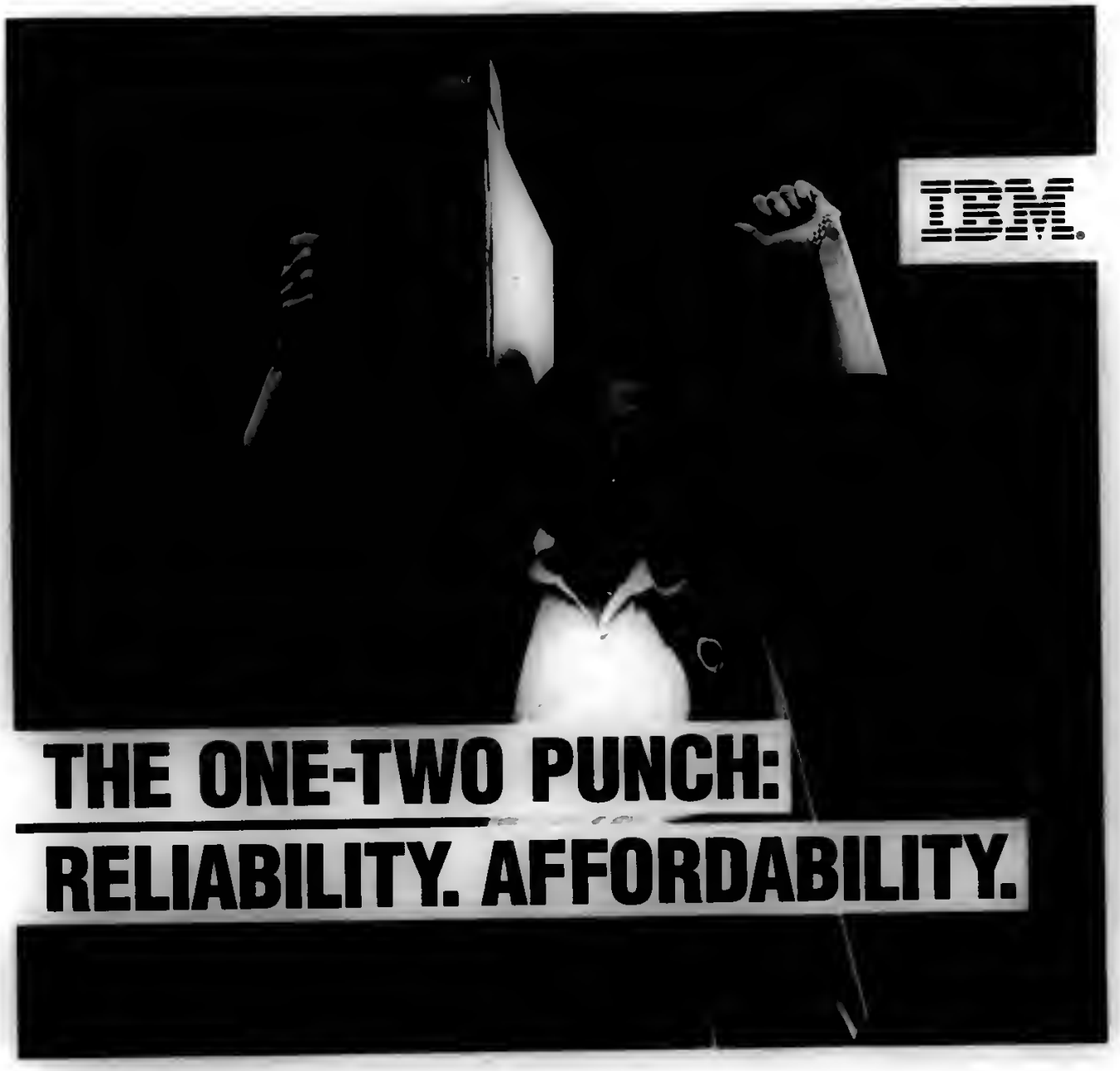
Much of this focus has resulted in increased spending on application-level intrusioo-detection and firewall technologies in the year since Nimda struck, said John Pescatore, an analyst at Gartner Inc.

Nimda also underscored the need for companies to install all patches recommended by software vendors, said Marty Lindner, a team leader for incident handling at the CERT Coordinatioo Center in Pittsburgh. The worm succeeded because it took advantage of several well-known holes in popular software products, he said.

CONSIDER THIS

Nimda Lessons

- Network security alone is insufficient.
- Application- and database-level protection is a must.
- Vendor software updates and patches must be kept current.



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[1]See IBM study by Timothy J. Dell, "A White Paper on the Benefits of Chipkill-Correct ECC for PC Server Main Memory," dated November 25, 1997, available at the following: http://www.ibm.com/servers/eserver/pseries/campaigns/chipkill.pdf. IBM, the e-business logo, Chipkill, pSeries and *e-business is the game. Play to win* are trademarks or registered trademarks of International Business Machines Corporation in the United States and/or other countries. UNIX is a registered trademark of The Open Group. Other company, product and service names may be trademarks or service marks of others.

CA to Announce, But Not Ship, Security App

Portal-based software due early next year

BY MARC L. SONGINI

LOOKING TO simplify the lives of IT security administrators, Computer Associates International Inc. this week is expected to announce a portal-based console that will combine multiple security management user interfaces into one screen.

Plans for the console, dubbed the eTrust Security Command Center, were divulged by CA officials last February [QuickLink 27675] and discussed at the CA Wurld user conference held in April.

But it's still not ready for shipment. CA is looking for beta sites to start testing the software next month, and it plans a general release sometime early next year.

Once the application is available, it will be able to take data feeds from different security software products and either send alerts to IT staffers or respond to problems automatically, said Russell Artzt, executive vice president of alliances and eTrust solutions at CA.

"We have taken Command Center as a centralized location for dealing with all sorts of security violations," Artzt said. For example, he said, an IT security administrator will be able to view end-user access violations in one window on the console while other windows display things such as firewall activity and potential system vulnerabilities.

To expand the console's usefulness with non-CA security tools, Artzt said the Islandia, N.Y.-based company is partnering with other security vendors to create connectors for sharing data. CA cited deals with four vendors, including firewall developer Check Point Software Technologies Ltd. in Redwood City, Calif.

In concept, the technology promised by CA is appealing, said Kari Jackson, an infrastructure engineer at Brigham Young University (BYU) in Provo, Utah. IT workers at BYU hope to be part of the beta-test program for the security console, he said.

BYU currently uses a handful of CA's security tools, as well as Cisco Systems Inc.'s virtual private network software. But each product has its own management interface, and Jackson said it's cumbersome to click through all the screens to check on the status of the university's systems.

But CA isn't the only vendor pushing centralized security administration software, said James Hurley, an analyst at Aberdeen Group Inc. in Boston. IBM's Tivoli network and systems management unit and smaller companies like NetIQ Corp. in San Jose and e-Security Inc. in Rockledge, Fla., already offer security console products, he said.

The centralized management being provided by the different vendors "is long overdue," Hurley said. "The biggest problem we run into is most buyers don't have the staff to handle the complexities of the IT infrastructures they have."

CA plans to support a variety of automated responses in its console, according to Artzt. CA hasn't set pricing yet. ◗

Console Plan

The eTrust Security Command Center software will be able to do the following:

- **Take real-time data feeds from various security tools and present the information to administrators on a single screen.**
- **Generate automated responses to security problems or send alerts to IT workers.**

CA Converges IT, Physical Security

As part of its security management push, CA is also getting ready to start beta-testing software that's designed to help protect a company's facilities from corporate espionage or other physical incursions.

The eTrust 20/20 application will interface with security systems and send alerts through a Web browser to users about abnormal behavior it detects, according to CA. The software will be able to take data feeds from things like access card readers and create profiles detailing the areas that individual workers normally access. It then will be able to detect if a worker enters at an odd hour a department he typically doesn't access.

CA's goal is to "converge security in a holistic manner across combined physical and IT systems," said Russell Artzt, executive vice president of alliances and eTrust solutions at CA. The company hopes to start beta-testing early next year, he added.

– *Marc L. Songini*

Microsoft Continues Move Into Storage Management

Buys maker of secure file access software

BY CAROL SLIWA

Microsoft Corp. advanced its drive into the data storage management market last week with the acquisition of XDegrees Inc., a small developer of software designed to enable secure access to information stored across enterprise systems.

Terms of the deal weren't disclosed, and Microsoft declined to comment beyond a prepared statement touting the synergy between XDegrees' focus on distributed information access and Microsoft's concentration on storage.

Michael Tanne, CEO of Mountain View, Calif.-based XDegrees, said his 2-year-old company's software permits continuous access to IT resources, regardless of where they are, without having to deliberately address a specific disk or file system.

"Our system allows you to have a name or link to that file system, just like a URL, and when you click on that link, you get the file," Tanne said. "You didn't have to know or think in advance where that file is. You reference the file by its link or its name, and the location of the file is abstracted away from the user."

XDegrees' technology assets and some members of its 14-employee team will be relocated to Microsoft's campus in Redmond, Wash., effective immediately. Tanne said he won't be joining Microsoft, but an unspecified number of XDegrees' engineers plan to do so.

XDegrees was acquired by Microsoft's core file services group, according to Tanne. But Tanne added that the group obviously has ties to the enterprise storage group that was formed late last year under Microsoft Senior Vice President Bob Muglia.

Analysts have been speculating for months about the direction Microsoft will take in the storage market. Since Muglia took the reins of the company's newly formed enterprise storage division late last year, that group has been quiet with details about its plans.

Muglia's group is charged with developing "a cohesive product and business strategy for the evolution" of Microsoft file systems, network-attached storage, storage-area networks, backup, continuous availability, near-line storage and storage resource management, according to Microsoft's Web site.

A spokesman earlier this year said Muglia's unit would be considering partnerships and technology developments, but beyond that, no business decisions had been made.

XDegrees Files

Privately held company in Mountain View, Calif.

Founded in 2000, backed by Redpoint Ventures and Combrian Ventures.

Founders include former executives from AdForce, Hewlett-Packard Co., Junglee, Microsoft, Oracle Corp. and Verity Inc.

Makes software for secure file access to data stored across distributed enterprise systems.

Laura Koetzle, an analyst at Forrester Research Inc. in Cambridge, Mass., said the XDegrees software should be useful technology for Microsoft, with its ability to insert a "virtual logical file-system layer" between users and their various storage disks, creating a unified view that is searchable as a single resource.

"I'm not sure how terribly strategic it is, but it'll certainly be an incremental improvement over the existing Microsoft .Net file system technology," she said.

Bill Nortb, an analyst at IDC in Framingham, Mass., said the XDegrees server software, in addition to easing file access, also "acts as a point of authentication for security purposes, controlling access to the data."

"It's like extending DNS beyond domain names into content management. I think this is the attraction for Microsoft," North said. ◗

CA to Announce, But Not Ship, Security App

Portal-based software due early next year

BY MARC L. SONGINI

LOOKING TO simplify the lives of IT security administrators, Computer Associates International Inc. this week is expected to announce a portal-based console that will combine multiple security management user interfaces into one screen.

Plans for the console, dubbed the eTrust Security Command Center, were divulged by CA officials last February [QuickLink 27675] and discussed at the CA World user conference held in April.

But it's still not ready for shipment. CA is looking for beta sites to start testing the software next month, and it plans a general release sometime early next year.

Once the application is available, it will be able to take data feeds from different security software products and either send alerts to IT staffers or respond to problems automatically, said Russell Artzt, executive vice president of alliances and eTrust solutions at CA.

"We have taken Command Center as a centralized location for dealing with all sorts of security violations," Artzt said. For example, he said, an IT security administrator will be able to view end-user access violations in one window on the console while other windows display things such as firewall activity and potential system vulnerabilities.

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FOUNDRY
NETWORK

BRIEFS

WorldCom Begins Hunt for New CEO

WorldCom Inc. said it's beginning a search for a new CEO to replace John Sidgmore, who was named president and CEO in April just prior to the company's Chapter 11 bankruptcy protection filing. The telecommunications vendor added that it hopes to find a replacement for Sidgmore "in an accelerated time frame." Sidgmore plans to return to his previous role as vice chairman, WorldCom said.

Quantum to Cut 1,100 Jobs in Profit Bid

Milpitas, Calif.-based storage vendor Quantum Corp. said it plans to cut about 1,100 jobs in the first phase of a restructuring program. Initial changes include the outsourcing of some manufacturing operations and consolidation of the company's development facilities. Quantum, which hopes to become profitable by March, said more actions will be announced within 90 days.

CMGI Sells Off Units

Andover, Mass.-based CMGI Inc. said it has divested its NaviSite Inc. Web hosting unit and Engage Inc. software subsidiary. CMGI, once a highflying e-business investment firm, said majority ownership in NaviSite to ClearBlue Technologies Inc. in San Francisco for an undisclosed price. Engage's management team bought that unit for up to $8.5 million in cash, according to CMGI.

Short Takes

IBM said it bought El Segundo, Calif.-based Holosofx Inc. and plans to integrate the company's business process modeling tools into its WebSphere Business Integration software. . . . UNITEDLINUX, a consortium set up by four software vendors, said the first version of its merged operating system is due for release in November.

Northrop Grumman Rolls Up Army IT Deal

$300M contract is largest ever to support global military information operations

BY DAN VERTON

IN WHAT is being called the largest contract of its kind, the U.S. Army last week tapped Northrop Grumman Corp. to support its worldwide combat information security operations.

The $300 million contract rolls up six existing agreements into a single deal that will add 220 IT security jobs to the Herndon, Va.-based company's IT division, according to Jim O'Neill, president of Northrop Grumman IT TASC. (The aerospace and defense contractor acquired TASC Inc. and its parent company, Litton Industries Inc., last year.)

Northrop Grumman will be responsible for "acquiring, protecting, managing and exploiting information" to support Army combat operations around the world, O'Neill said. It is the first global information operations contract of its size and scope, he said. Direct assistance will be provided to Army commands worldwide through the Army's Land Information Warfare Activity at Fort Belvoir, Va.

Defending Information

Information operations, or IO, is a military term that pertains to both the offensive and defensive aspects of using IT systems. The military defines IO as "actions taken to affect adversary information and information systems, while defending one's own information and information systems."

According to O'Neill, the IO capabilities the company is bringing to bear to help the Army perform its missions around the world could be applied to improve homeland security. "This has a lot of applicability to state and local governments as well," he said.

Other experts agreed. At a recent government-sponsored conference on homeland security, Rosanne Hynes, a senior executive on the Pentagon's Homeland Security Task Force, said the federal government should take a "teach them to fish" approach when working with state, local and private-sector entities.

Developing security-awareness technologies "is something we've spent a lot of time and money on," she said.

Larry Abella, vice president and director of strategic security at Northrop Grumman IT TASC, said that in addition to traditional network security work, the Army contract calls for the development of visualization technology.

"One of the challenges that system administrators have is understanding the data that is coming out of the intrusion-detection devices," he said. "We've developed ways to visualize data sets that indicate what types of attacks you are being subjected to and what the impact is."

Positions to Fill

The majority of the positions being added to Northrop Grumman's IT division will be in network security, monitoring and analysis. In fact, the company as a whole currently has more than 500 funded IT-related positions that have yet to be filled — in addition to those called for by the contract, said O'Neill.

While many industries are cutting back on IT staff and budgets, O'Neill said, the defense sector seems to be reaping the benefits of the downturn in other markets and the war on terrorism.

Defining Terms

Information Operations (IO): Actions taken to affect information and information systems.

Offensive IO: Activities, supported by intelligence, to affect an adversary's decision-makers' ability to achieve or promote specific objectives.

Defensive IO: Integration and coordination of policies and procedures, operations, personnel and technology to protect and defend information systems. Defensive IO ensures timely access to accurate and relevant information, while denying adversaries the opportunity to exploit friendly systems.

Symbol Gets N+I Spotlight

Wireless switch centralizes security

BY MATT HAMBLEN
ATLANTA

Despite its smaller size than in past years, NetWorld+Interop Atlanta last week produced some excitement, especially among visitors to the Symbol Technologies Inc. booth, where the new Mobius Axon Wireless Switch was displayed.

The product, which was announced last week, puts wireless management and security on a switch instead of at numerous access points for wireless LAN data, IP voice and other applications. Holtsville, N.Y.-based Symbol reported strong interest by enterprise users in testing the device, which won Overall Best in Show at N+I.

"It's a dynamic device," said Roy Cappadona, a telecommunications engineer at Business Communications Inc. in Morrisville, N.C., an integrator and distributor of gear from Nortel Networks Corp. IP telephony is "hot," and simplified management of bandwidth for voice in Wi-Fi networks is becoming more important, he said.

But one potential wireless LAN user wasn't sure a fixed switch makes sense in every application. AMB Identification and Timing US Inc. in Smyrna, Ga., is trying to take lap-time data generated by racing cars and distribute it wirelessly back to each pit crew from a central location, said Hector Perez, a technical sales representative for the company. "But I'm not sure a fixed switch would make sense in a variety of racing venues," he said, because it might be hard to have a chassis-mounted switch installed in each location.

Sprint Corp.'s booth also generated excitement over the company's August launch of PCS Vision products for faster wireless data and voice speeds over its Code Division Multiple Access 1XRTT network.

But in a keynote address, Sprint President Ronald LeMay said, "Companies like Sprint are operating in a brutal environment." He added that the "actions of some of our peers aren't doing the likes of Sprint any favors," referring to the financial scandals surrounding WorldCom Inc. and others.

LeMay did say in a short interview that Sprint sales teams have seen a 33% increase in the past two months in qualified enterprise customers seeking to expand or add new services with Sprint. "That includes companies that wouldn't talk to us before. . . . Some say they are worried WorldCom will turn them off as employees leave WorldCom," LeMay said.

WorldCom officials have repeatedly said they aren't going to imperil customers' networks, even though the telecommunications company filed for Chapter 11 bankruptcy in July.

Continued from page 1

Airport WLANs

checked the LANs as he traveled through the airports the week of Sept. 2.

Only 32 of the 112 WLAN access points (AP) detected by Rushing had the Wired Equivalent Privacy (WEP) protocol turned on, he said. WEP is an encryption technology that's built into all 802.11b, or Wi-Fi, WLANs. In addition, Rushing said, the Service Set Identifiers (SSID) hadn't been turned off on more than half of the APs he found with the help of a WLAN card and NetStumbler AP-detection software. Many of the APs were broadcasting plain-text SSIDs, he added.

Unencrypted Broadcast

At San Francisco International Airport, for example, Rushing picked up an unencrypted WLAN broadcasting the file directory of a Windows NT server and numerous PCs belonging to Northwest Airlines Inc. Rushing said the LAN was set up in such a way that a hacker could have used the available information to learn the network's topology and steal passwords.

Todd Spaude, Northwest's managing director of infrastructure for technology products and services, said the airline had been testing a self-service check-in system at the San Francisco airport that used a WLAN for network connections to a server at company headquarters in Minneapolis. But the LAN was shut down last Monday, he said.

Spaude acknowledged that Northwest didn't turn on WEP on the test system. "That was a mistake," he said, adding that Northwest will use hard-wired network connections if it offers self-service check-in capabilities in the future.

Theresa Wise, vice president of information services at Northwest, said she would be reluctant to use WLANs in any kind of production environment until the security issues related to the technology are resolved.

Rushing said that at Chicago's O'Hare International Airport, he detected several WLAN APs broadcasting an SSID of "X-ray" and transmitting unencrypted file requests. The APs appeared to be associated with systems used to support the airport's luggage X-ray machines, he added.

Rushing said he also detected unsecured WLANs at the airports in Atlanta and San Diego, including APs that were broadcasting Dynamic Host Configuration Protocols, or DHCP, in the clear. DHCP is used by network administrators to automatically assign IP addresses to users who are getting access to WLANs.

John Pescatore, an analyst at Gartner Inc., said the security holes uncovered by AirDefense are the result of "pure sloppiness" that could be easily remedied by following best practices guidelines developed by Gartner and other consulting firms. Securing WLANs "is not rocket science," he said.

But he added that the security shortcomings found at the four airports, particularly the DHCP broadcasts, could be easily exploited by hackers.

AirDefense CEO Jay Chaudry said that the informal audit didn't represent a hacking attempt on the part of Rushing. The company's executives routinely monitor the security of WLANs when they travel, Chaudry said.

Officials at the city of Chicago's Department of Aviation and the airports in Atlanta, San Francisco and San Diego didn't return calls seeking comment. Dave Steigman, a spokesman for the U.S. Transportation Security Administration, said officials at the agency "do not comment on security procedures or operational security at the nation's airports."

Mary Schiavo, former inspector general at the U.S. Department of Transportation, said WLAN security holes need to be addressed because attacking the systems used at airports is a "logical next step" for terrorists.

SNIFFING GOES GLOBAL
Amateur sniffers find plenty of unsecured WLANs during a "worldwide war drive".
QuickLink: 32740
www.computerworld.com

Draft High-Speed WLAN Spec Approved

The Institute of Electrical and Electronics Engineers Inc. (IEEE) has approved the draft of a new WLAN standard – 802.11g – that will provide new data speeds of 54M bit/sec. in the same 2.4-GHz frequency band now used by the older 802.11b standard.

Brian Grimm, a spokesman for the Wireless Internet Compatibility Alliance in Mountain View, Calif., said he doesn't expect any 802.11g products to hit the market until next summer because the draft specification still requires final IEEE approval.

Grimm said that because the 802.11g standard is backward-compatible with 802.11b, users with a "b" card will be able to access a "g" network, but only at the 11M bit/sec. data rate of "b" systems.

Alan Reiter, an analyst at Wireless Internet & Mobile Computing in Chevy Chase, Md., said 802.11g WLAN systems should also have the same range as "b" systems (roughly 100 to 300 ft. indoors and double that distance outdoors), saving companies that adopt the new standard from having to install new wireless antennas or access points.

That's not the case with the 802.11a standard approved by the IEEE last year. The 802.11a standard also offers data rates of 54M bit/sec., but in the shorter-range 5-GHz frequency band. Grimm said the 5-GHz band offers less likelihood of interference from cordless phones and microwave ovens, which also operate in the 2.4-GHz band. It also offers a wider band – 200 MHz of spectrum for the "a" standard, vs. 83 MHz for the "b" standard.

Grimm said WLAN vendors will try to bridge their bets by offering combination access points that operate either in the "a" or "g" band, with "g" systems also supporting users with "b" cards.

– Bob Brewin

U.S. Talks Cybersecurity at UN Conference

Seeks greater worldwide cooperation

BY DAN VERTON
NEW YORK

The Bush administration took its cybersecurity message to the world this month, urging increased cooperation on cybercrime prevention and the ironing out of legal guidelines.

Speaking here to an audience of 150 diplomats from 22 nations, Paul Kurtz, senior director for national security for the President's Critical Infrastructure Protection Board, said that the lessons of Sept. 11 affect the information security realm and that the world must do more to cooperate and coordinate its anticybercrime efforts.

"We need to expand sharing of information on watch and warning of imminent threats," Kurtz told a packed United Nations conference session at the Global InfoSec 2002 conference. Kurtz called the recent increase in the prevalence and sophistication of cyberattacks a "case for action," adding that current statistics indicate that as many as 110,000 serious security incidents will occur by the end of this year.

"The world's economy is increasingly dependent on IT," said Kurtz. "This is more than e-commerce and more than e-mail, and it's more than buying a book online." He added that the "worst-case scenario can happen," with infrastructure attacks leading to devastating economic consequences.

While Kurtz underscored the need for a public/private partnership to provide for the common defense of cyberspace, he also urged the world community to take action on global legal cooperation.

"We would like to see countries accede to the Council of Europe treaty or adopt laws that are similar," Kurtz told attendees. The Council of Europe Convention on Cybercrime is aimed at developing a common criminal policy for international crimes committed online. However, the treaty is nonbinding until individual nations ratify it.

"International coordination is insufficient," particularly in the realm of tracking down those responsible for global IT security events, such as the "I Love You" virus, said Thomas Longstaff, manager of survivable network technology at the Software Engineering Institute at Carnegie Mellon University.

But Kurtz praised the "culture of security" created by the Organisation for Economic Co-operation and Development, a group of 30 nations that has drawn up new guidelines for information and network security cooperation in the wake of last year's Sept. 11 terrorist attacks.

International cooperation could be enhanced with a single point of contact if other nations were to appoint cybersecurity czars, similar to the position now held in the U.S. by Richard Clarke, said Kurtz.

A senior Bush administration official involved in setting technology policy said that from a legal perspective, it's critical that other countries adopt laws that are compatible with the Council of Europe treaty because current agreements have too many loopholes. "Even if we have a law enforcement cooperation agreement with them, the agreements might not apply unless there is a violation of their domestic law," said the administration official, who asked not to be identified.

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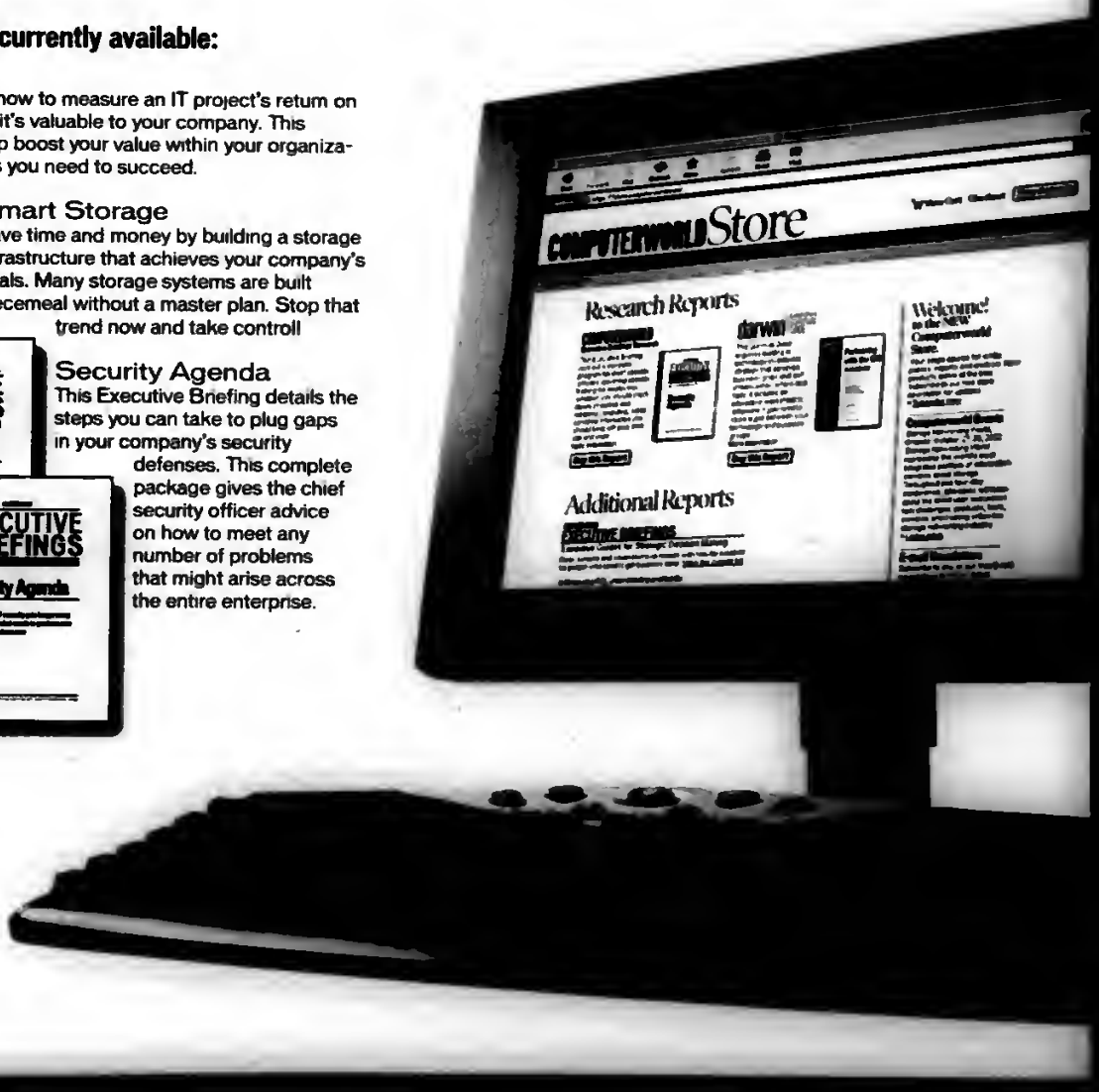
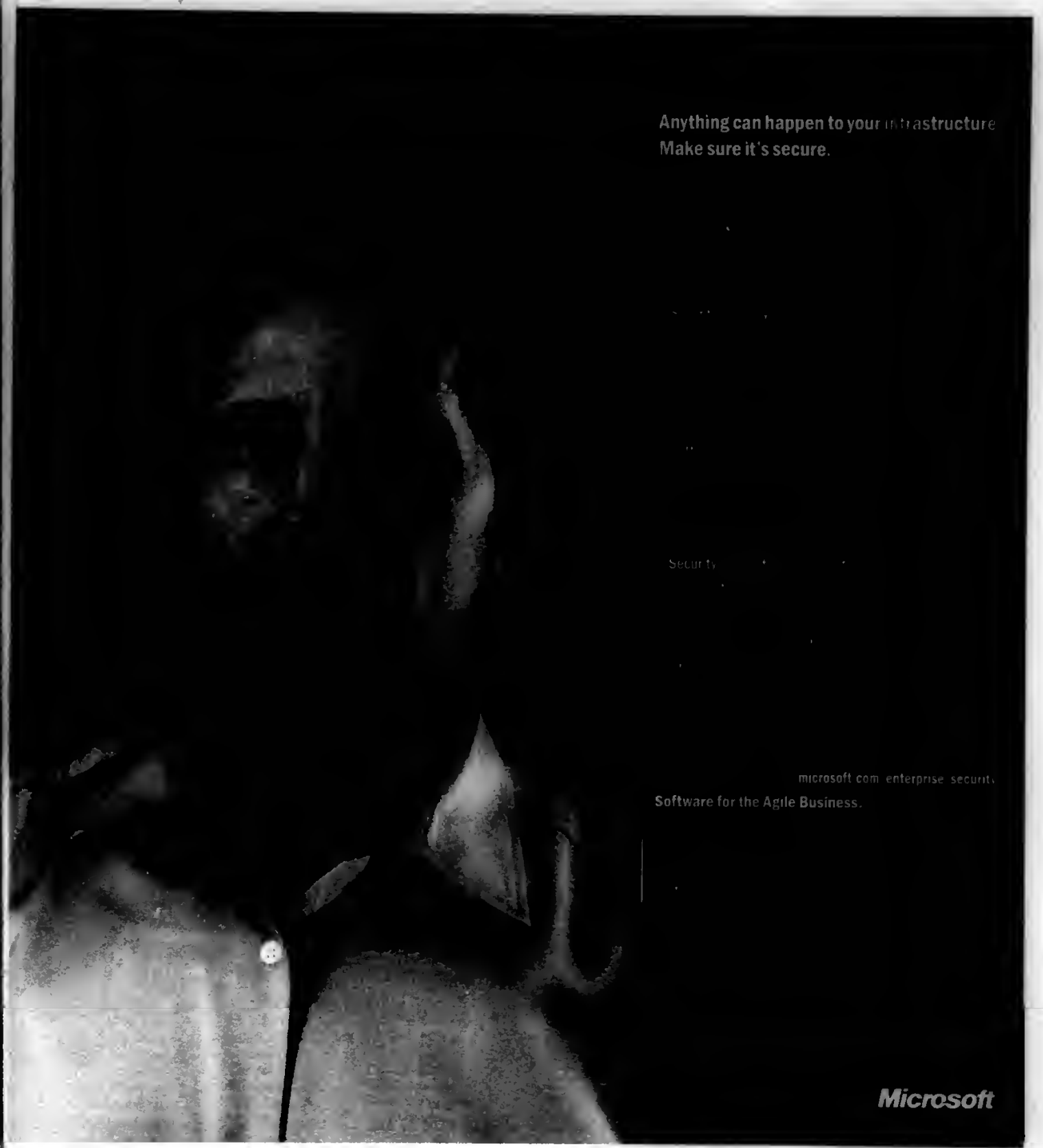
Security Agenda

This Executive Briefing details the steps you can take to plug gaps in your company's security defenses. This complete package gives the chief security officer advice on how to meet any number of problems that might arise across the entire enterprise.

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Microsoft Looks To Boost Use of 64-bit Windows

BY MATT BERGER

At its Windows .Net Server DevCon conference in Seattle earlier this month, Microsoft Corp. tried to clear away some of the fog surrounding its ongoing move into 64-bit computing.

Microsoft last year released an initial 64-bit version of Windows for servers based on Intel Corp.'s Itanium processors. But the Windows Advanced Server Limited Edition software has been adopted only by a small number of high-end customers so far, said Bob O'Brien, group product manager for Microsoft's Windows .Net Server division.

OS KNOW-HOW

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In an attempt to increase its profile in the 64-bit market, Microsoft early next year plans to ship 64-bit versions of its upcoming Windows .Net Server 2003 operating system as well as its SQL Server 2000 database. The 64-bit database was released for beta-testing in July and is what many users are waiting for before they switch high-performance applications from Unix servers to Windows boxes, said Sheryl Tullis, a SQL Server product manager at Microsoft.

Dollar Rent A Car Systems Inc. has been testing the 64-bit version of SQL Server 2000 Enterprise Edition for over a month. The Tulsa, Okla.-based car rental company currently uses Oracle database software on Unix systems, but Larry Scott, IT services manager at Dollar, said SQL Server's ability to manage application memory is impressive.

"I was blown away by the speed," he said. "And I think you can make a pretty strong business case — both in software licensing fees and hardware platform costs — that it's going to be cheaper [than Oracle databases]."

Blue Bell, Pa.-based Unisys Corp. demonstrated a 64-bit Windows server that was able to run 2,000 database queries per minute, compared with 300 queries per minute on another system that was running 32-bit versions of the operating system and SQL Server.

But some users at the conference said they don't have a burning need for the added horsepower of 64-bit Windows.

"We'll definitely let somebody else blaze the path on that," said Roy Vawter, a senior manager at Siemens Dematic AG, a Nuremberg, Germany-based subsidiary of Siemens AG that makes factory automation equipment.

Berger writes for the IDG News Service.

Siebel Turns To IBM for App Integration Help

BY MARC L. SONGINI

Siebel Systems Inc. is tapping IBM's cross-application technology capabilities as part of an attempt launched last spring to reduce integration headaches for users of its customer relationship management (CRM) software.

The two companies last week announced a deal under which San Mateo, Calif.-based Siebel will license business process templates and object-based data models built into IBM's WebSphere Business Integration software. Siebel said the goal is to give users an expanded road map for linking its CRM systems to other business applications.

For example, a manufacturer could use a Siebel catalog application to create price quotes for customers, said Jeff Scheel, vice president and general manager of alliances at Siebel. But the Siebel software might have to access a separate manufacturing system to check product availability, he added. IBM's templates can help users set up a seamless data flow between the systems, Scheel said.

The licensing agreement with IBM is the latest step in Siebel's Universal Application Network (UAN) integration technology initiative. Siebel introduced UAN in April and this month announced a CRM software upgrade that includes pieces of the technology [QuickLink 32668].

James Governor, an analyst at Illuminata Inc. in Nashua, N.H., said application integration is the No. 1 challenge that most CRM users face. The agreement with IBM "seems like a good deal" for Siebel users, Governor said, although he added that Siebel also plans to continue working with IBM's rivals in the application server software market.

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Stratus Expands Fault-Tolerant Server Line

Four-CPU system pitched as lower-cost alternative to clusters for Windows users

BY JAIKUMAR VIJAYAN

Stratus Technologies Inc. last week added two models to its line of fault-tolerant servers aimed at Windows users who want near-continuous system uptime, including a box that supports up to four Intel Xeon processors.

Maynard, Mass.-based Stratus said the four-CPU ftServer 6500 was designed to deliver close to nonstop system availability for users of Microsoft Corp.'s Windows 2000 Advanced Server operating system. The machine can provide 99.999% availability — or about five minutes of hardware downtime annually — at prices that start at just over $65,000, according to Stratus officials.

That positions the ftServer 6500 as an attractive alternative to server clustering technologies for companies that want to install high-availability Windows setups, said James Johnson, an analyst at The Standish Group International Inc. in West Yarmouth, Mass.

"The biggest benefits are the reduction in complexity and the cost savings," said James M. Rinkel, vice president of systems services at Nova Information Systems Inc., an Atlanta-based provider of credit card processing services.

Unlike clustered configurations that require users to maintain separate servers and operating systems, the ftServer 6500 delivers high-availability features inside a single box, with one or sometimes two backups for every component. And it does so without any of the fail-over scripting requirements or administrative overhead issues that users of clustered systems face, Rinkel said.

Nova uses the initial two-processor servers that Stratus released 18 months ago to run applications such as e-mail and some of its point-of-sale credit processing systems. The applications were migrated earlier this year from a Compaq Computer Corp. server cluster to the Stratus boxes. Rinkel said he's looking at using the ftServer 6500 to support bigger applications, such as Nova's databases.

Stratus also rolled out a beefed-up two-processor system called the ftServer 5240. Analysts said the only other vendor offering the same kind of fault-tolerant hardware for Windows is Marathon Technologies Corp., a Boxboro, Mass.-based start-up that sells two-CPU systems.

Greg Cullen, director of technology at Marathon, said his company has no immediate plans to develop a quad-processor model. But he said Marathon's servers offer nearly the same performance as the ftServer 6500, in part because they use faster Xeon chips.

Stratus' limited marketing reach has been an obstacle, said Gordon Haff, an analyst at Illuminata Inc. in Nashua, N.H. But he added that Stratus may have more success with the ftServer 6500 because it's trying to partner with systems integrators and software vendors in key vertical industries. ▶

SERVER SNAPSHOT

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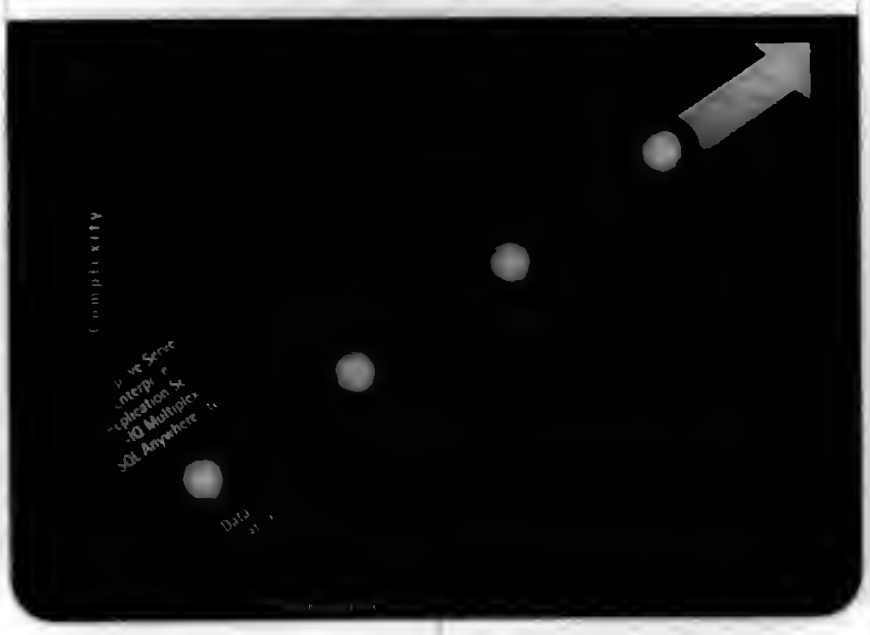

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PATRICIA KEEFE

Mapping IT's Future

WE RECEIVED A LETTER last week from a dispirited worker with 15 years of IT experience. He's been laid off, can't find a job and expects to leave the profession. He says the influx of cheap labor that cost him his job is "the beginning of the dismantling of the American technology worker."

Patricia Keefe is editorial director at Computerworld. You can contact her at patricia_keefe@computerworld.com.

Coincidently, some industry pundits are strongly predicting the demise of corporate IT departments. That will happen by 2006 or thereabouts, according to David Foote, president of Foote Partners and a *Computerworld* columnist. He and many others predict that IT will be dispersed throughout the enterprise as part of the fabric of the company. Business users will be capable of taking on lower-level technical tasks, freeing a smaller core of IT staffers to focus on analytical and strategic issues.

Will CIOs and IT departments become obsolete? Are they morphing into new roles? What impact will a computer-literate workforce have on changing those roles?

I threw those questions out to *Computerworld*'s Premier 100 award winners and Executive Suite community members, and an impressive 160 of them took the time to send me some thought-provoking feedback. The economy aside, most IT leaders remain optimistic that there will be a role for IT. Reading over their comments, I gleaned this consensus:

Is the IT labor market shrinking? Most said yes, thanks to the evolution of the technology itself. As technology becomes easier to user, more efficient, self-healing and ubiquitous, a lot of the heavy lifting can be left to business units and users, or become outsourced. One IT executive said it's too expensive to develop software in the U.S. "Techno nerd" jobs will outright disappear, particularly ones in programming and application development. But database, network and systems administrators are safe. "They are the unsung heroes of IT," another exec said.

Most said IT departments are permanent, but shrinking. Forget about the nuts and bolts. Ideally, said one IT vice president, "the emphasis in technology will move away from managing projects to applying information systems effectively." Others said to prepare for a heavy emphasis on standards-setting, infrastructure-tending, process re-engineering and strategizing. Understanding the business side of the equation will become absolutely critical, especially as business units take over some IT functions and development efforts. Adaptability and a lifelong commitment to learning will become essential.

What about the impact of a more computer-savvy workforce? Most of those who replied carefully distinguished between what one reader called experienced users of technology and experienced technologists. "They are magnificent users of what others have already created, sort of the race car drivers of the techno world," said one veteran IT pro. To be sure, the younger generations will enter the workforce with higher expectations for performance and service, which in turn will be provided by new waves of IT workers. "As technology becomes easier to use, IT becomes more complex to manage," said one college dean of computing.

Although the future of IT seems safe, don't get too comfortable. "The genie is out of the bottle," warns one of your peers. "Stop believing and behaving [like] you are the only resource who can do IT-related tasks!" Another algorithm for success is to "keep reinventing yourself" because traditional IT is about to go by the boards.

As our kids become more technically astute and the technology gets better, it will put pressure on traditional IT workers to stay ahead of the needs of end users in order to stay employed. But staying ahead is what you've always done. ◗

PIMM FOX

IT Helps Streamline R&D Process

INSIDE consumer products giant Procter & Gamble's global R&D facilities, engineers and biologists concoct new and better ways to do laundry, keep teeth white and gulp down more snack foods. Although 40% of P&G's 18,000 R&D staffers are in Cincinnati, the rest are in Asia, Europe and Latin America. The variety of engineering, patent and product research talent is so dispersed that it's difficult to know who the resident experts in particular fields are and where they might be located.

Pimm Fox is a freelance writer in San Francisco. Contact him at pimmfox@pacbell.net.

Organizing all that knowledge and experience and making it accessible and easy to share help the company's operations immensely, according to Mike Telljohann, associate director of global R&D computing at P&G.

Telljohann set out to replace a P&G topic-based bulletin board that had fallen into disuse. "There were so many different types of entries that it was cumbersome," he recalls.

Portal technology helped remove those complex barriers. Using software from AskMe Corp., Telljohann created a place where P&G users could post established knowledge, examples of past work and even individual biographies. That means a researcher in Caracas can now find someone in the Beijing R&D center who has expertise on a common problem.

"We needed a way to capture documented knowledge," says Telljohann, noting that researchers were being asked similar questions repeatedly.

"A researcher in Kobe, Japan, asked about an analytical instrument for a chemical compound," he says. "It turned out someone in Cincinnati had purchased one a year ago with good results." That knowledge wouldn't have

For more columnists and links to archives of previous columns, go to computerworld.com/columns

been shared so easily before the portal.

Today Telljohann runs two data repositories, one for people, the other for subject-matter expertise; currently there are 900 registered experts.

"It captures conversations in question-and-answer format in a dialog database," he explains. "When you look for a topic, it brings up the people as well as prior exchanges."

Dubbed Innovation Net, the intranet lets users set up subject categories and relieves experts from repeating answers.

The AskMe system is integrated into P&G's Lotus Notes e-mail client. "Installed out of the box, it alerts experts via e-mail that a question has been asked," says Telljohann. "There's also a way for people to monitor conversations without getting involved; we call that the observer role."

Of the 7,000 P&G users who have tried the portal, more than 5,000 are repeat users, underscoring its success.

With the system growing by one to two experts and 20 to 30 users per day, maybe someday they'll perfect self-folding laundry.

DAVID MOSCHELLA

Let Antitrust Process Linger For Justice

REMEMBER the clamor a few years ago about the need to fast-track the Microsoft antitrust case right up to the Supreme Court? In retrospect, this "urgency" looks more than a bit embarrassing, further evidence of our industry's then-inflated sense of self-importance.

The irony is that a long and winding antitrust process might make more sense in the IT industry than in other businesses. It helps us gain a much better perspective on the many complex issues involved. Consider what we have learned since the Department of Justice first launched its current lawsuit in 1998.

It is possible to compete with Microsoft. Eventually, Microsoft might get the better of RealNetworks, Palm, Oracle, AOL Time Warner, Java, Google, the open-source community and others, but the evidence that companies can effectively compete with Microsoft is much stronger now than when the trial began.

AOL/Netscape has mostly itself to blame. Research by WebSideStory shows that Netscape's share of the global browser market has plummeted to an all-time low of 3.4%. Certainly, Microsoft's tactics have been a big part of this story, but the fact remains that if Netscape's owner, AOL, had committed itself to using Navigator, the browser would still be an important Internet industry force.

David Moschella is an author and independent consultant. Contact him at [redacted]

Open standards are proving resilient. Both the emergence of XML and related Web Services standards, and the success of the World Wide Web Consortium and other standards bodies, suggest that Microsoft probably won't be able to leverage its desktop monopoly to control the majority of emerging Internet standards.

PC competition isn't foreclosed. Apple's ability to rejuvenate itself via innovative designs and the emergence of Linux PCs (they're even available at Walmart.com) shows that serious desktop competition, while still unlikely, is possible.

Many legal claims are frivolous. It's hard to take seriously most of the private business and consumer class-action suits against Microsoft. For example, Sun's Java is readily available to anyone who wants to use it. The demise of Be Inc. was much more due to its own greed in dealing with Apple than anything Microsoft did. And there's little evidence that the success of Windows and Explorer has resulted in significant consumer harm.

Importantly, all five of these developments tend to favor Microsoft, a pattern Judge Colleen Collar-Kotelly has surely recognized. This suggests that she will probably determine that the current proposals — forbidding exclusionary behavior, standardizing Windows licensing contracts, releasing APIs, facilitating non-Microsoft default settings and establishing ongoing federal government oversight — are sufficient remedies for Redmond's past transgressions. This would be a perfectly reasonable decision.

However, these steps alone won't assure that Microsoft's future market power will be effectively checked. The best way to do this is to also require that Microsoft publish its Windows source code. Here, industry trends are working against the company, as its aggressive claims regarding the damage source-code availability would cause look increasingly unfounded. Over time, Microsoft might even benefit, as Windows innovation accelerates and software quality improves.

Mandating source-code availability would also move this case toward closure, demonstrating that the federal government is committed to supporting a competitive IT industry climate, and punishing the flagrant abuse of monopoly power. Microsoft would almost certainly appeal, with the Supreme Court likely having the final say. If this process requires another year or two, so be it. In this case, justice delayed appears to be justice refined.

READERS' LETTERS

Going Paperless

WHILE THERE is some logic to Kemper Casualty's decision to move as much of its paper files to a digital format as it could, it's sort of the common knee-jerk reaction to a catastrophic loss of paper records [QuickLink 32533]. Those of us who have spent years in records and information management are aware of the dangers of such decisions, especially the failure to adequately evaluate business processes and issues such as data/media stability and retention requirements. Issues related to collaborative use of information by offices across the country are definitely worth considering, along with consideration of privacy protections, especially in financial, insurance and medical environments. Laws and regulations governing data protection are being enacted on a regular basis, and it's critical for organizations to ensure that data is properly segregated to limit access to a need-to-know basis. Other considerations are the enhanced requirements for generation of backup data sets, additional communications requirements for data networks at remote locations and provisions for computer equipment and training for individuals to access the information.

Lawrence J. Medina
Senior records administrator
Lawrence Livermore National Laboratory
Livermore, Calif.

Aliens Feel Layoff Effects

WHAT THE unemployed grass-roots objectors to the H-1B visa fail to realize is that an individual working under an H-1B visa is at just as high a risk of losing his job as a U.S. citizen performing the same job ["Congress May Bear Brunt of H-1B Anger," QuickLink 32229]. An H-1B visa doesn't guarantee employment and is valid only if the alien remains employed in the specific skilled position. If the alien is demoted, the H-1B visa is no longer valid, and the alien is out of status. If the alien is laid off, a similar legal status results. With this in mind, talented foreign workers are at an even greater personal risk than U.S. citizens: Lose your job, lose your right to stay in the U.S. Furthermore, employers aren't forced to afford employment preference to H-1B holders over U.S. citizens. If an H-1B holder is spared from a round of layoffs, it's not because of immigration status.

Robin L. Sheedy
Associate
Hemenway & Barnes
Boston

AS/400 Holds Its Own

THE ARTICLE "Legacy Ties Weigh on CRM Project" [QuickLink 32680] unfairly singles out the AS/400 as a legacy system that's hard to interface to. It isn't. It provides developers and users with modern SQL data access, solid Web access and easy data access in a variety of formats. Some AS/400 software is written poorly, just as some software is poorly written for many other platforms. It would be just as hard to implement CRM on Windows servers if the legacy applications were written as poorly as it appears Countrywide Credit's are written. The AS/400 is an exceptionally productive computing platform with very low total cost of operation. It is rock-solid, with far better uptime numbers than almost any other computing platform.

Chuck Landress
Senior programmer/analyst
Austell, Ga.

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EDITOR'S NOTE

VISIONARIES SEE A TIME when server farms and networks will be self-managing, self-healing and self-learning. Sophisticated algorithms will do the routine work of network and systems administrators — configuring and optimizing servers, identifying bottlenecks and fixing small problems before they become big ones. That's roughly the goal of IBM's futuristic eLiza project for "autonomic computing," for example, and I really, really hope it all works out.

But, as IDC pundit John Gantz has pointed out [QuickLink 21088], the history of overarching frameworks for network and systems management isn't pretty. They usually peter out because of a lack of interoperability and the emergence of technologies not anticipated in the megaframework.

Still, as science fiction writer Isaac Asimov liked to say, machines should be doing the drudgery so the humans can do more creative things. The idea of intelligent software and self-managing machines certainly has a lot of appeal — especially if you've just been paged at 2 a.m. to deal with a network outage.

In the meantime, there's the real world of today's network and systems administrators. That's where this special report is planted, with articles on how to deal with bandwidth hogs and how to use application performance management software to see what response times your end users are getting.

Besides, whenever I think about self-managing schemes, I think of our own Shark Tank column. That's where network and systems administrators tell their tales of rodents in remote servers, PCs in cold-storage lockers and network outages caused by the janitor kicking out the electrical plug.

We'll never eliminate the human element. ◗

PHILIP ANDERSON

Mitch Betts (mitch_betts@computerworld.com) is director of Computerworld's *Knowledge Centers.*

Taking Control

New strategies for reining in Web traffic, bandwidth hogs and server proliferation.

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- **Case studies:** IT managers in three industries – hospitality, online gaming and e-learning – describe how they've boosted IT performance.
- **Big-iron lure:** Partitions allow a single mainframe "hotel" to house multiple OS "guests." Check out three ways to go about it.

QuickLink 21200
www.computerworld.com

The Story So Far

The first IT headache was burned-out vacuum tubes. Now it's bandwidth hogs and Internet traffic. By Frank Hayes

KEEP IT RUNNING. That was a primary goal of the technicians working on the Electronic Numeric Integrator and Calculator (ENIAC). The first large-scale electronic computer in the U.S. used 17,480 vacuum tubes. Early estimates suggested that one tube or another would be failing at any given time so that ENIAC would never complete a calculation.

But J. Presper Eckert, the genius behind the 30-ton behemoth, came up with a solution. Carefully testing tubes, he determined that they usually failed early or late in their lives. With a rigorous program of regularly swapping in new, tested tubes, Eckert eventually kept ENIAC running productively for more than 12 hours at a stretch.

That was computer systems management circa 1946.

By the mid-1950s, vacuum-tube and electrostatic memory were being replaced by magnetic core memory, which didn't burn out. Programming by plugs and wires was being replaced by programs called "software." And in 1955, programmers at the General Motors Research Center wrote the first operating system — a batch-processing monitoring program for the IBM 701.

That made it easier to keep mainframes running at capacity. But to keep mainframes from wasting time doing input and output, programs were written, punched onto cards, converted to tape and only then run on mainframes. The results were printed on a separate machine. And mainframes had to be manually reconfigured when switching between different programs.

But in 1964, IBM announced its System 360, a line of compatible mainframes designed to handle their own I/O and to run different kinds of software without reconfiguration. With hardware and an operating system that simplified many systems management tasks, data processing managers could begin to focus on optimizing system performance, not just on feeding the mainframe's tape drives.

In the early 1970s, core memory was replaced by dynamic RAM chips, and in 1973 IBM developed lower-cost, higher-capacity hard disk drives. Data processing shops needed the extra memory and storage because they were now running online transaction processing systems with hundreds or thousands of concurrent users.

Storage management became important. So did having a system for tracking problems and making changes — fixes couldn't simply be made between batch jobs, because the system wasn't allowed to go down. And data processing managers shifted their focus to improving system response time.

In 1974, IBM rolled out its System Network Architecture, a standard networking protocol for linking peripherals and terminals. But minicomputers from Digital Equipment Corp. and Hewlett-Packard Co. were going into use as departmental computers, complicating systems management. And in 1980, AT&T Corp. began issuing resellable licenses for Unix to other vendors, launching a wave of relatively inexpensive workstations and servers.

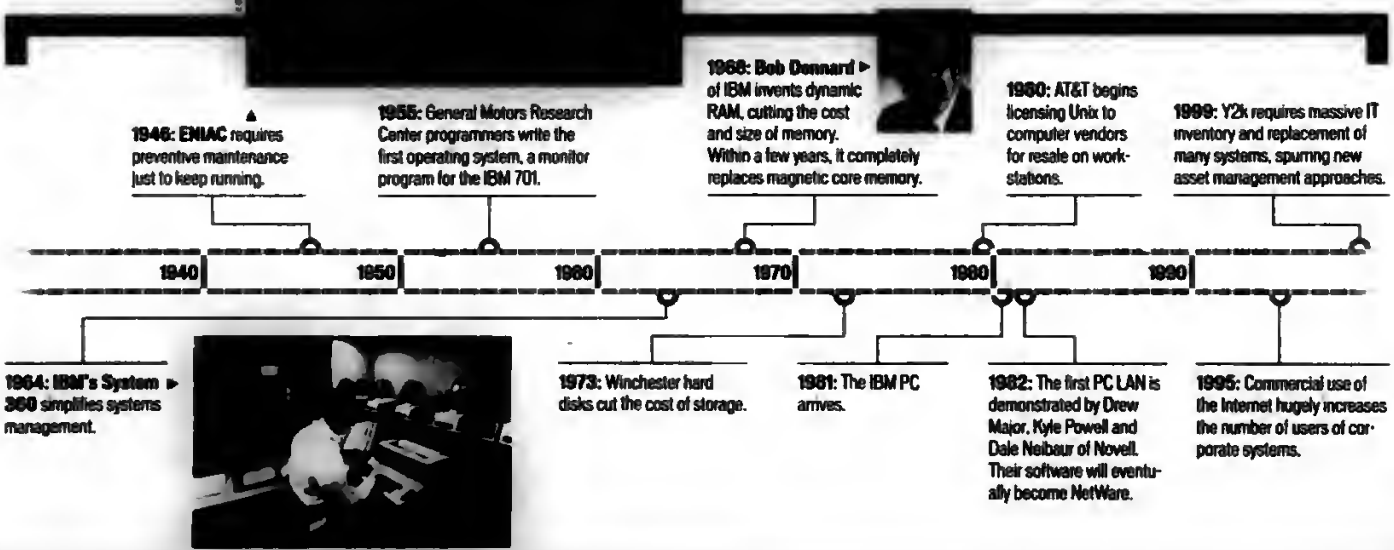
In 1981, the IBM PC arrived — followed less than a year later by the first demonstratioo of a PC LAN. Novell Inc. shipped NetWare in 1983, and 3Com Corp. was already shipping Ethernet and TCP/IP networks for PCs, workstations and servers. Now managing availability, capacity and performance was an issue for networks, too.

Networks and PCs also made it practical to decentralize data processing, complicating the job of managing systems. Client/server systems required multiple computers *and* the network to be tuned for performance. And security and disaster recovery became integral parts of systems and network management.

The 1990s saw the recentralizatioo of IT into larger-than-ever data centers, along with more concerns than ever about capacity, performance and security as users connected via the Internet. The Y2k threat required IT shops to inventory and upgrade all their systems. And ever-increasing bandwidth requirements for multimedia and networked applications have blurred the lines between systems and network management.

More than 50 years after ENIAC, the goal for IT is to manage thousands of computers and a maze of networks as if they were a single system. But one goal is the same: to keep it running.

And now, on with the story . . . ▶



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CIO KIM ROSS

Coping With Bandwidth Hogs

Five ways to control your hungriest bandwidth users. By Sami Lais

LET'S ADMIT IT — we were all made a little drunk by the booming economy. When applications with a deep thirst for bandwidth bellied op to the network bar, the call was to just buy more bandwidth. Cheap bandwidth gushed from the taps as though the party would never stop.

"Bandwidth hasn't been so expensive that you couldn't afford to just get more to stay ahead of demand," says Kim Ross, CIO at Nielsen Media Research in Dunedin, Fla.

"The real driver here is money," agrees Corey Ferengul, an analyst at Meta Group Inc. in Stamford, Conn. "The solutioo used to be JBM: Just Buy More. Today, I don't know any company that has excess money to buy bandwidth."

In any case, buying more bandwidth may oot be the solution, Ross says.

"In the old days, you had one main application, one pipe, one concern," he says. "But with Internet applications, more resources are shared. If you add more capacity to a shared pool without a clear idea of why or where it's needed, you're unlikely to get the result you want. And the tools just haven't been there to help you manage IP networks, to isolate problem cases."

That has left enterprise network managers seeking new ways to slake their networks' bandwidth thirst.

1 Monitoring and Enforcing

"The way we deal with it is we watch bandwidth utilizatioo day by day, week by week and watch for spikes in utilization," Ross says. "Usually it's someone trying something new, but nine times out of 10, it's not something that's business-critical. We'll do the detective work to find out where it's coming from, but it takes way more effort than it should."

Universal Health Services Inc. in King of Prussia, Pa., has 65 remote sites oo its wide-area network. "It's sometimes tough to tell what or where the problem is," says CIO Linda L.E. Reino. "We've put a sniffer

oo connections, and it's ID'd some rogue devices on the LAN, polling every few minutes and using a lot of bandwidth."

But monitoring isn't foolproof, she says. During a Nimda virus scare, a virus checker oo Universal Health's LAN was examining every packet of HTML traffic. "This thing made the network crawl. Our clinical order management system is HTML-based," Reino says.

Online gaming and peer-to-peer networking services that allow downloading of audio files, software and movies, such as those offered at the Morpheus, Kazaa and Grokster Web sites, can quickly gobble up bandwidth.

"We have had a Morpheus problem, and we handled it by blocking it at the firewall so it can't connect," says David Leuck, technical services manager for the Culver City, Calif., municipal government.

Part of tuning the network at investment management services firm Ark Asset Management Co. in New York was "toughening up on users," says Danny Shpak, manager of Ark's IT group. "That means no gaming, for one thing."

Ross adds, "One aspect of our control policy is to be sure the IT governance body knows the guidelines. Clear, well-understood policies can help you prevent some problems from even coming up."

2 Streamlining Networks

Ark uses Eye of the Storm from New York-based Entuity Ltd. to monitor its network and locate and ease the pain points. Streaming stock quotes constitute the single greatest use of bandwidth, says Shpak, but "no one thing really put us over the top."

Monitoring helped him identify bottlenecks such as those resulting from misconfigured connections betweeo clients and servers. Sometimes the fix was as simple as moving an application server closer to those workers who used it most. In other cases, he had to invest in larger routers or switches or more bandwidth.

"Tuning was most important," Shpak says. "I'm interested in solving problems, not measuring bandwidth. For me, the more important issue is to have my network run cleanly."

A well-tuned network gives him another edge, he adds. "When application volume increases and you're running out of bandwidth, you have the data to present to management to get more bandwidth," he says.

3 Centralizing Operations

Centralizing some network functions can trim bandwidth use while addressing some security goals, says Tom Revak, domain architect at GlaxoSmithKline PLC, a pharmaceutical company based in Research Triangle Park, N.C.

"If you centralize data center functions, you cut down on the amount of replication and synchronization of data," Revak says. "It also helps maintain data integrity, if only because there aren't so many copies to synchronize and replicate."

CHARGEBACK AHEAD!

Charging departments for their network usage, a controversial method for controlling bandwidth demand, may be in the future for many enterprises.

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4 Testing and Tuning Applications

Test applications before installing them enterprisewide to make sure they aren't going to swamp your network. Then tune existing applications for the same reason.

Atlanta-based United Parcel Service Inc. does "extensive studies of the behavior of applications," says Mark Morelli, telecommunications director for the global shipping company. UPS not only tests but also assiduously monitors applications' bandwidth use, he says.

"We have to; a lot of our sites only have 56K connections," Morelli says.

"Many of the Web-based HTML applications have become real bandwidth hogs," he adds. Those that demand too much bandwidth are simply banned from the network.

"We're waiting for the day when true class-of-service management can be done in the network," Morelli says. "Meanwhile, the business determines the importance of applications. Based oo those priorities, we use throttling tools to carve out specified amounts of bandwidth that the applications can use."

Ferengul says that other companies are taking the same approach. "We're seeing a lot more interest in traffic-shaping, because people aren't as interested in buying more of anything," including bandwidth, he says.

"There are plenty of good tools that can help you optimize your network," says Dennis Drogseth, an analyst at Boulder, Colo.-based Enterprise Management Associates Inc. "Which one is best for you depends partly oo your ability to make the most of what you buy."

Pat Miller, telecommunications manager at Baltimore-based mobile and modular building supplier Williams Scotsman Inc., bought Austin, Texas-based NetQoS Inc.'s SuperAgent application response-time analyzer to identify the cause of slowdowns on ber company's WAN. But she's also using the tool to examine the performance of thin-client applicatioo traffic.

"Very large packets and very small packets were fine," she says. "But certain medium-size packets were clogging the network." Application developers correlated the packets to the code that produced them and reworked the code.

Williams Scotsman's bandwidth experience isn't unique.

"One client was going to buy more bandwidth for an application," explains Ferengul. "But we looked at the code and found it did things like use six calls to a database just to do the log-in." Tuning the application obviated the need for more bandwidth.

A new pharmacy system went live at Universal Health Services last year, and "the hit on the bandwidth was obvious," Reino says. "We weren't meeting our service-level agreements. We got the vendor to accept packet accelerators on the application. No one wants to let you in their application, but sometimes you just have to do it."

Screaming Video

The words *streaming video* can send some managers of bandwidth-constrained networks screaming into the night.

After all, streaming content, along with instant messaging and music downloads, account for an average 25% of corporate bandwidth use, according to a report by Lawrence Orans, an analyst at Stamford, Conn.-based Gartner Inc.

Bring it on, says Jake Star, vice president of computer services at the Mohegan Sun casino in Uncasville, Conn. His new $4 million network can take it.

In April, the casino finished a $1.2 billion expansion that more than doubled its hotel space with the addition of 1,200 rooms, enlarged the casino and added a 100,000-square-foot convention center, a shopping mall with 50 stores and restaurants, and a 10,000-square-foot sports arena.

The complex has video to the desktop for all PCs, and video-based training for employees has begun. The hotel offers free high-speed Internet access in all rooms, videoconferencing, and custom video LANs between hotel rooms and servers in convention center exhibits. Mohegan Sun had been using one T1 line, but the expanded property shares two full T3 lines from two providers for redundancy.

In April, the casino broadcast its grand opening in full-motion video to desktops via IP multicast. And the casino is in the early stages of offering on-demand video training.

Although such video services may be the exception today, "network managers who believe they will be able to block access to streaming video or deny requests to support it are sorely mistaken," Orans says. Businesses are finding legitimate uses for video applications, he says, which means networks will have to be upgraded to support video traffic.

- Sami Lais

5 Just Buy More

The days of simply overprovisioning are far from over, says Elisabeth Rainge, an analyst at IDC in Framingham, Mass. Sometimes there's no getting around the need for more bandwidth.

"When you've got some mission-critical application that isn't optimized for networks and you can't get the vendor to optimize it, the only way around it is to make your pipes so huge that they can handle it," Leuck says. ●

Lais is a Computerworld contributing writer in Takoma Park, Md.

ROI

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Mapping The Network

Automation tools that identify and map network connections can reduce downtime and cut administrative costs. By James Cope

YOU CAN'T MANAGE what you don't know. Whether you're tweaking the performance of your network or preparing for a major upgrade, you can set the stage for a positive outcome by uncovering what's connected where and knowing how well it's working.

"Over time, networks get disassembled. They become like something that's been put together with chewing gum and baling wire, and you start to get instability problems and latency," says Bill Carter, a network engineer at systems integratioo and consulting firm Sentinel Technologies Inc. in Downers Grove, Ill.

Companies that aren't familiar with their own network assets and wbere problems might exist can spend a lot of money adding new equipment on top of old with only marginal gains in performance, Carter adds.

But the process of finding and mapping your network connections, also known as asset discovery and analysis, can itself be a costly endeavor when conducted manually or with tools that require too much human intervention. That's especially true when network technicians have to be dispatched to wiring closets to figure out what's really there.

For large enterprises that have the luxury of in-house resources, mapping the network means sending technicians off to remote locations to inventory routers and switches, determine installed versions of router software and check configurations — all of which incur travel costs and lost productivity at the home office.

Smaller organizations, even though their networks are less complex than those at large companies, could be forced to call in contractors at $125 to $200 per hour.

To keep costs in line and get a better idea of what's on the network, users like Jim Olsen, technology director at Shepherd Public Schools in Sbepherd, Mich., are turning to automated tools.

"We had a performance problem on the network," Olsen recalls. "We kept running into brick walls and called in a service guy." Wheo Olsen noticed that the outside technician, who was charging $185 per hour, was using a product called Network Inspector from Fluke Corp. in Everett, Wash., to check the port status of the network switches, he decided to get a demo copy. Network Inspector automatically determines which device is connected to which port and identifies the source of problems, such as improper device configurations on duplicate IP addresses.

Olsen says that when be downloaded the trial copy, he discovered that it also works in tandem with Microsoft Corp.'s Visio Professional, the graphics program Olsen and many network managers use to manually diagram their networks.

"When I installed Network Inspector, it asked me if I wanted the Visio application I already had installed to map the network," Olsen explains. When be said yes, the Microsoft application imported the data collected by Network Inspector and turned it into a graphic representation that showed all of the devices on the Shepherd Schools network.

Although the 250-seat license for the Fluke software cost $8,000, Olsen estimates that it will pay for itself within one to two years.

Cleaning House

Discovering and mapping assets on a network is absolutely necessary prior to a major upgrade, Carter says. He says his company frequently uses a mix of asset-discovery and network analysis software.

In one instance, for an enterprise user who asked not to be identified, the Sentinel team used WhatsUp Gold, an automated asset-discovery and network performance monitoring tool from Lexington, Mass.-based Ipswitch Inc., in conjunction with Link Analyst from Network Instruments LLC in Minneapolis. The latter tool generates a map of the network and analyzes response times across network links. Each product sells for just under $800.

The combination of tools enabled Sentinel engineers to uncover routers that were using outdated protocols and a mix of equipment from different manufacturers, including some vendors that were no longer in business.

Carter, who just recently served as a contract network engineer for the Illinois Department of Human Services (IDHS) in Springfield, says that even newer networks can benefit from automated discovery tools. For example, on the IDHS network, which supports 20,000 users across 300 offices, automated discovery tools in Cisco Systems Inc.'s CiscoWorks help keep the infrastructure free of unauthorized devices and save big bucks by automating routine software upgrades on network switches.

Carter says that by using the $15,000 CiscoWorks wide-area network tools, which include a software image manager, it takes only eight hours to update the 500 Cisco Catalyst 2900 XL switches on the IDHS networks. A manual update, on the other hand, took 100 man-hours and was costing the agency about $17,000 for each of the two or three upgrades made each year.

Three Reasons to Map Network Assets

1. **Typically, automated asset discovery is faster and less costly than physical visits to wiring closets and desktops.**
2. **An accurate map of network assets makes it easier to troubleshoot problems in-house.**
3. **Discovery of older network assets and interconnections may point to configuration changes that can improve performance without major upgrades.**

Cope is a Computerworld contributing writer. He can be reached at jc@jamescope.com.

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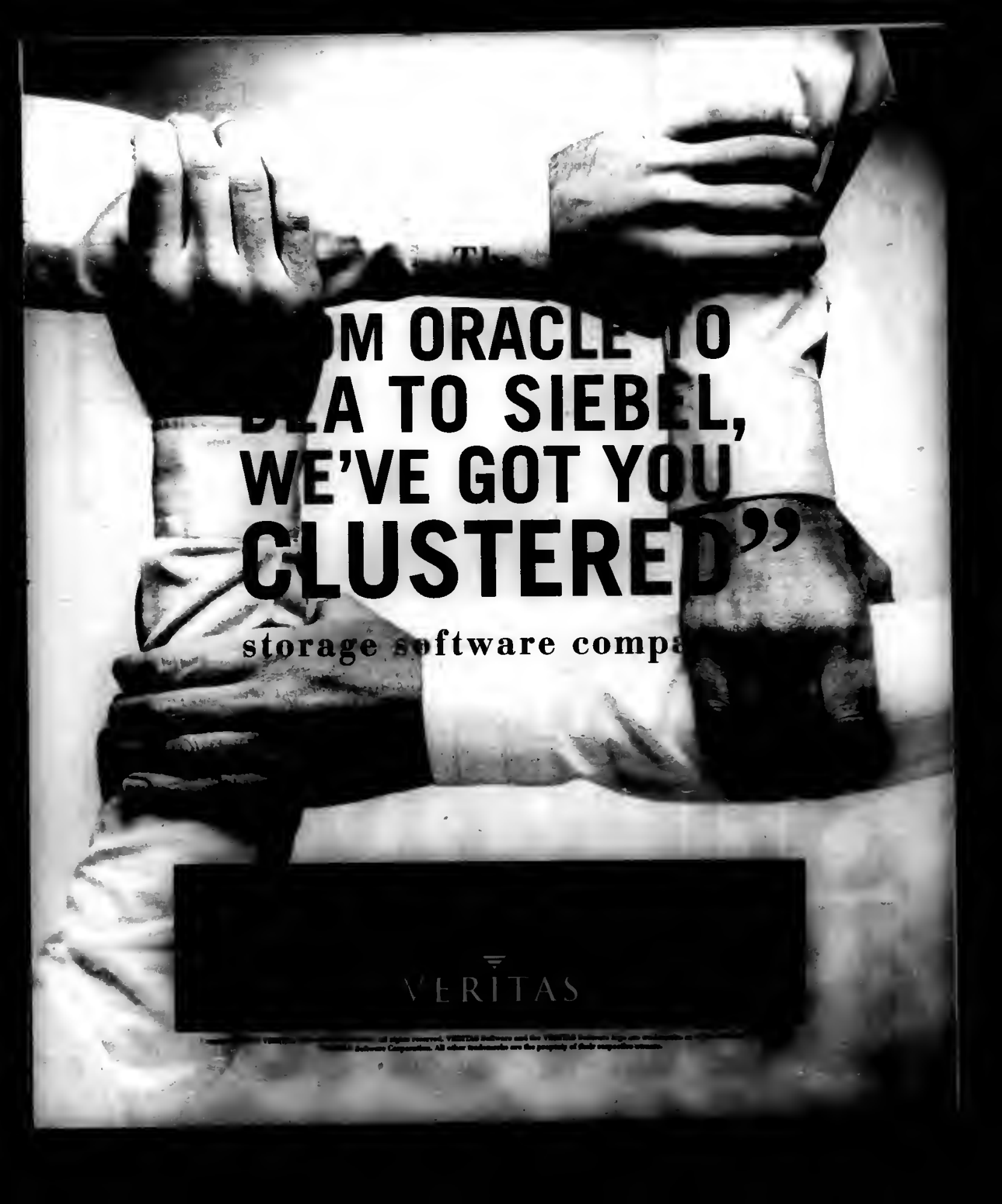
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Speedy Deliveries

Content delivery networks make sure that critical information gets to its destination in a hurry. Here's how they work. By Sami Lais

A CONTENT DELIVERY network can make you a hero, providing a flak jacket for your e-commerce site and easing your network bandwidth squeeze. Or it can be a costly mistake that never makes its return on investment and takes you down with it.

Scot Hull (right), author of *Content Delivery Networks: Web Switching for Security, Availability, and Speed* (McGraw-Hill, 2002) and content networking architect at AOL Time Warner Inc.'s Chantilly, Va., office, explains what a content delivery network is, what it isn't and what it can and can't do for your enterprise.

What is content delivery networking? In its broadest sense, it's simply getting content from a provider to a client. In a narrower sense, it's what can be done to impact delivery of mission-critical content — video, audio, data or text — and guarantee that it gets from its source to its destination in a timely fashion.

How important is it to most enterprises? That depends. Take a company like Amazon.com — it's a content delivery business. They depend entirely on their infrastructure to drive revenue. If they don't get the content to their subscriber base, they're not going to stay in business very long.

What technologies are involved in content networking? Basically, you've got caching, load balancing and global load balancing.

Caching allows people to store, as locally as possible, content like static graphics or basic text. By keeping the cache close to the users, each new user's request doesn't have to traverse the Internet to get the same content. In theory, performance should improve.

And after caching? That's the subject of my book. There are lots of ways to optimize the other pieces of your infrastructure and create an overlay network. That's what's gotten interesting: what you do in addition to caching. How to optimize the back end? That's where load balancing comes in.

Say I'm an enterprise and I'm looking at optimizing my own infrastructure. I can buy a big, expensive, robust server that's going to process thousands, millions, trillions of transactions per second [TPS]. Or I can buy a couple dozen cheap servers and a very clever box: a load balancer. It can take all the incoming content requests and fan them out across my cheap servers. If I need to scale up, I don't have to go out and spend another million dollars on a big server. I'm going to spend another couple thousand dollars to buy a couple more servers.

The next step is to balance traffic across all your data farms. That's where global load balancing comes in. You set up a mechanism so traffic is sent to a fail-over site if the primary fails. If the implementation is really smart, it will route traffic to the most local site based on where the user is, so the request doesn't have to traverse the Internet.

Whenever I hear "application redirection," Secure Sockets Layer (SSL) comes up. When content providers need a secure way to deliver their content, SSL is the only reliable and universal mechanism. But a server can generally process fewer than 200 SSL TPS. Without dedicated SSL hardware, the server takes CPU time that would be dedicated to processing applications or serving content to handle the SSL exchanges. Performance of even high-end servers drops radically as the number of SSL transactions rises.

Adding a card from nCypher allows the server to offload the SSL processing — up to 800 TPS — to the card and free the CPU to do other things. Recent advances in chips from Broadcom and Cavium have upped [that number to 10,000 and 4,000 SSL TPS, respectively].

The number you get depends on your implementation. If we add a card that can support 2,000 SSL TPS, but the server only gets 500 sessions, then 1,500 possible sessions aren't used. Not terribly cost-effective.

The most efficient deployment is a separate appliance, like products from Array, NetScaler and Ingrian, among others.

Coupled with a load balancer, this separate appliance will allow capacity unused by one server to be reallocated to others that need it. A separate SSL appliance also allows for simple scaling; as more capacity is needed, additional appliances can be integrated behind the load balancer.

Here's how it works: SSL traffic comes into the site, passes through the load balancer and is transparently redi-

Performance Booster

A content delivery network speeds content delivery, provides redundancy and offers easy scalability using inexpensive servers. Here's how to do it:

- **Put a cache in your local network.**
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rected to the SSL appliances. These appliances then decrypt the traffic and send the unencrypted traffic back to the load balancer for load balancing to the server farm. The process reverses to send encrypted responses back to the client.

If your business depends on e-commerce, how does that change your game plan? There are two ways to approach this. One is DIY: Do it yourself. You buy the gear, hire the staff, build and maintain the site, manage content updates — the whole nine yards.

At the other end of the spectrum, you have someone else do it all for you. Companies like Digital Island, Akamai, IBM, CWI [Centrum voor Wiskunde en Informatica] — all have services that can make content delivery transparent to the provider. Of course, it's going to be expensive. Generally, outsourcing is never cheaper than DIY.

What about costs? For DIY, the costs you're worried about are those expensive recurring costs like WAN circuits. An OC3 line gives you 155M bit/sec. and can cost you several thousand dollars a month. But if you're a content provider like General Motors and you're providing content to the entire planet, 155M bit may not be enough. You could see that getting swamped, especially when you run one of your big ads on a new car that is the hottest thing ever.

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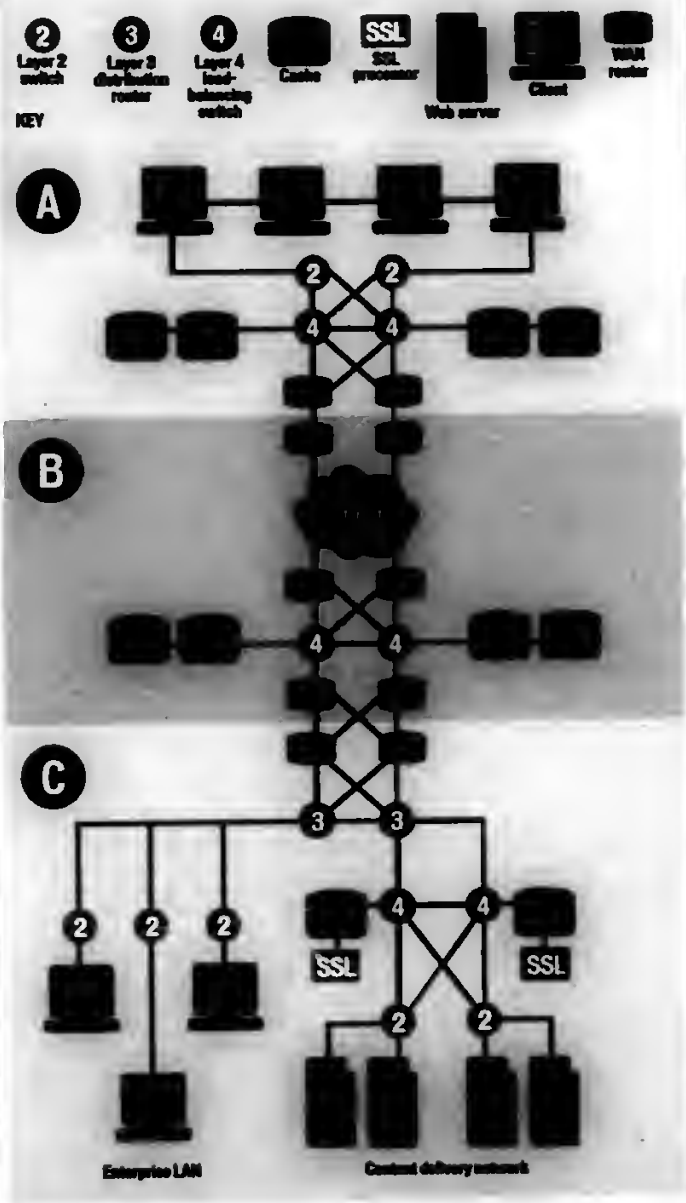

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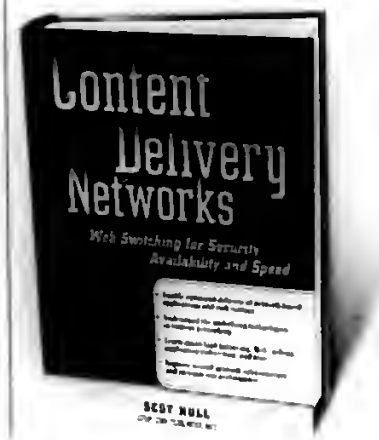

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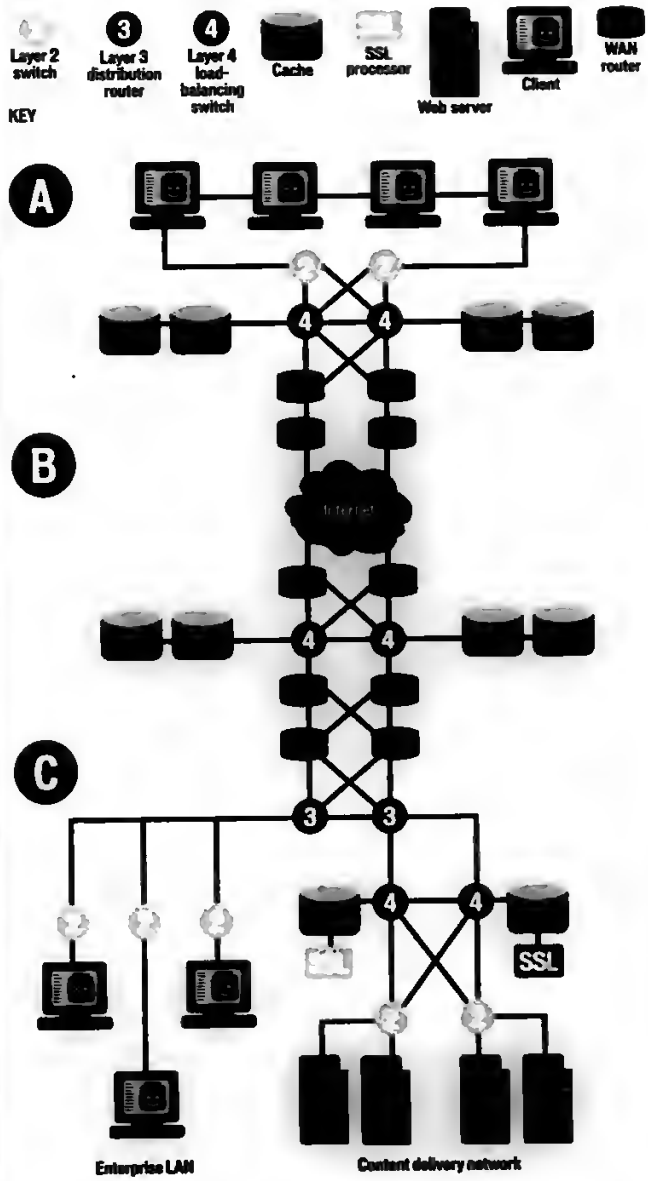

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Continued from page 41

co-locator? You want to be sure that some other company's traffic isn't going to swamp yours.

If I'm a co-locator, I've got lots of sites housed in my data farm, and the last thing I want is to have traffic from the World Wrestling Federation's big SmackDown on Thursday night shutting down storm warnings from Weather.com.

Bandwidth management would be a nice element to blend into a content management solution to ensure that all this infrastructure isn't going to get sucked up by any one content provider I'm hosting.

What about gotchas? The big gotcha is interoperability. Between vendors, it's awful. But standards are coming. For example, request-based routing — the protocol itself — will figure out the best route for traffic to take.

How does this affect the IT staff? Part of the cost of the technology is going to be support and maintenance. As a manager, I want to know how bad it's going to be. How alien is it going to be to my line guys? If they get a call at 3 a.m., how hard is it going to be for them to figure out what the problem is? Am I going to get support from my vendor if I need it at 3 a.m.?

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Lais is a Computerworld *contributing writer in Takoma Park, Md.*

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Why One Console Won't Do

Network And Systems Management Tools

As enterprise, [illegible] dependent on their networ[illegible] to run IT [illegible] network and systems management (NSM) tools to predict and prevent potential problems before they affect end users. The newest tools offer greater visibility into many types of devices, data [illegible] and applications and better analysis to convert raw data into useful information. But [illegible] product does it all.

By Drew Robb

TECH CHECK

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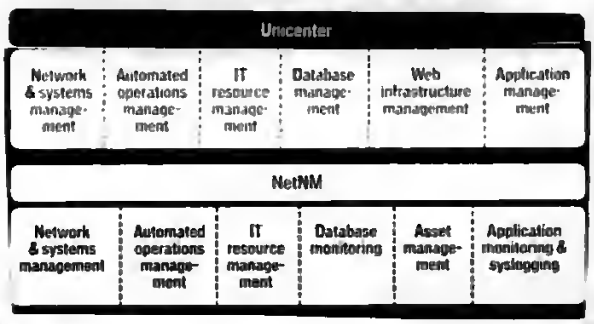

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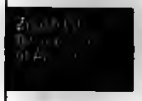

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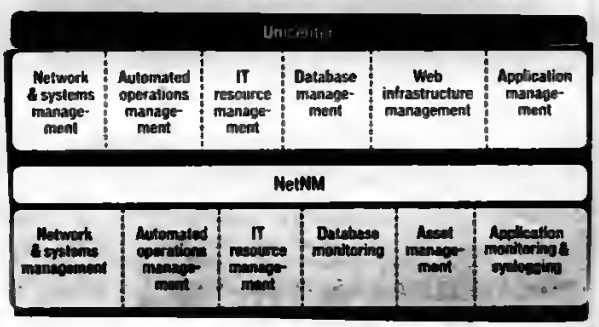

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Simple Network Management Protocol

DEFINITION

Simple Network Management Protocol (SNMP) is the standard way of checking that devices on a network are operating properly. With SNMP, devices on the network monitor their own activity, using built-in software called an agent, and store that information in a database called a management information base (MIB). An overall management program, such as NetView or OpenView, sends messages to the various agents on the network, which respond by sending back the MIB data.

BY RUSSELL KAY

YOU'VE GOT A good-size network with hundreds of users in several locations, connected by routers, hubs, bridges, switches, dial-up modems, Web servers, application servers — you name it. When everything's fine, then everything's fine. But what happens if a section of the network starts experiencing dropouts, outages, reduced throughput or other network-based errors? How do you know that something has gone wrong, discover where the source problem is and then fix it?

QUICK STUDY

This isn't a trivial issue. In today's economy, businesses are linked to one another and to their customers by networks that must be kept running around the clock. To do that, you need to know when there's a network problem, and you need to know *now*.

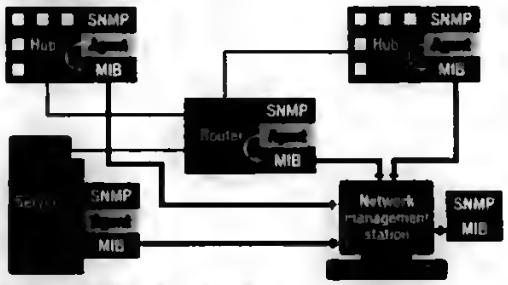
The most common mechanism for keeping tabs on network health is a standard called Simple Network Management Protocol (SNMP). Any device (which in this case can refer to software as well as hardware) that can be managed by SNMP contains a monitoring program, called an agent, that gathers information on that device's network activity. This information is in the form of messages called protocol data units (PDU) and is stored in an onboard database called a management information base (MIB).

At the network administrator's console, there's usually some type of monitoring application, often called a network management station, such as IBM's Tivoli NetView or Hewlett-Packard Co.'s OpenView. From this point, the administrator (or an automated or scheduled process) polls all or some of the network nodes, asking for whatever information has been collected.

At the device being monitored, another piece of software, called the master agent, looks at what's been stored in the MIB and sends it back up the chain to the network management station, where it can be collated and processed with information from other nodes to determine what's happening on the network. At this point, SNMP can also be used by the network administrator to reconfigure specific devices.

SNMP agents can also be set up to automatically notify the network management station if certain predefined conditions or events occur. These alerts are called traps.

How SNMP Works



- Black lines are normal network connections.
- Gold lines are SNMP agents getting PDUs and storing them in the MIB.
- Red lines are SNMP agents forwarding MIB data to the network management station, which stores them in its own composite MIB.

Past and Future

When networks were first created, problems could be solved only by network gurus using relatively primitive tools such as Internet Control Message Protocol and ping. As networks grew, however, these simple tools no longer sufficed for monitoring every device on a network.

The first specific network management tool was the Simple Gateway Monitoring Protocol (SGMP), which debuted in 1987. SGMP could monitor gateways but still wasn't a general-purpose tool. SNMP came along a year later, but only for TCP/IP networks. In 1993, SNMP was extended to use two other network transport systems, AppleTalk and Novell Inc.'s IPX protocols.

A more recent offshoot of SNMP is Rmon, a remote monitoring capability that gives a network manager the ability to monitor subnetworks as a whole, rather than just individual devices.

The more powerful and secure Common Management Information Protocol (CMIP), developed in the mid-1990s, was expected to replace SNMP. However, the fact that CMIP uses 10 times the network overhead has meant that SNMP is still the major player in the industry.

Despite its innocent-sounding name, SNMP isn't simple. It's a highly complex protocol that can be difficult to implement. Also, SNMP isn't very efficient. It wastes considerable bandwidth relaying unnecessary information, such as the version number, which is included in every message.

But one thing that sets SNMP apart from so many other standards is that it's not a mere paper specification but is widely available and interoperable among a variety of network components. ◗

Kay is a freelance writer in Worcester, Mass. Contact him at russkay@charter.net.

What Does SNMP Know, And Why?

Precisely what sort of information is collected by an agent depends to some extent on the type of device it's on. For example, Covalent Technologies Inc. in San Francisco offers SNMP management tools for the Apache Web server that can monitor the following functions and events:

HTTP TRAFFIC: How many requests are arriving per second? A sharp spike might indicate a denial-of-service attack, whereas a sharp downturn can mean that another part of the network is down.

DOCUMENT ACCESS: How many times are specific documents accessed or downloaded? This can immediately identify suddenly popular content – following a mention on national television, for example – and could tell you if you need to serve those pages from additional servers.

NUMBER OF CONNECTIONS: By letting you know how many active connections are maintained, as well as the cumulative total of connections, you can determine when your network is being overly stressed and whether people are able to access your site.

USER-SEEN ERRORS: If a user gets an HTTP error message such as the dreaded "Page Not Found" or "Service Unavailable," the network administrator can be alerted.

– *Russell Kay*

Simple Network Management Protocol

DEFINITION

Simple Network Management Protocol (SNMP) is the standard way of checking that devices on a network are operating properly. With SNMP, devices on the network monitor their own activity, using built-in software called an agent, and store that information in a database called a management information base (MIB). An overall management program, such as NetView or OpenView, sends messages to the various agents on the network, which respond by sending back the MIB data.

BY RUSSELL KAY

YOU'VE GOT A good-size network with hundreds of users in several locations, connected by routers, hubs, bridges, switches, dial-up modems, Web servers, application servers — you name it. When everything's fine, then everything's fine. But what happens if a section of the network starts experiencing dropouts, outages, reduced throughput or other network-based errors? How do you know that something has gone wrong, discover where the source problem is and then fix it?

This isn't a trivial issue. In today's economy, businesses are linked to one another and to their customers by networks that must be kept running around the clock. To do that, you need to know when there's a network problem, and you need to know *now*.

The most common mechanism for keeping tabs on network health is a standard called Simple Network Management Protocol (SNMP). Any device (which in this case can refer to software as well as hardware) that can be managed by SNMP contains a monitoring program, called an agent, that gathers information on that device's network activity. This information is in the form of messages called protocol data units (PDU) and is stored in an onboard database called a management information base (MIB).

QUICK STUDY

At the network administrator's console, there's usually some type of monitoring application, often called a network management station, such as IBM's Tivoli NetView or Hewlett-Packard Co.'s OpenView. From this point, the administrator (or an automated or scheduled process) polls all or some of the network nodes, asking for whatever information has been collected.

At the device being monitored, another piece of software, called the master agent, looks at what's been stored in the MIB and sends it back up the chain to the network management station, where it can be collated and processed with information from other nodes to determine what's happening oo the network. At this point, SNMP can also be used by the network administrator to reconfigure specific devices.

SNMP agents can also be set up to automatically notify the network management station if certain predefined conditions or events occur. These alerts are called traps.

Past and Future

Wheo networks were first created, problems could be solved only by network gurus using relatively primitive tools such as Internet Control Message Protocol and ping. As networks grew, however, these simple tools no longer sufficed for monitoring every device on a network.

The first specific network management tool was the Simple Gateway Monitoring Protocol (SGMP), which debuted in 1987. SGMP could monitor gateways but still wasn't a general-purpose tool. SNMP came along a year later, but only for TCP/IP networks. In 1993, SNMP was extended to use two other network transport systems, AppleTalk and Novell Inc.'s IPX protocols.

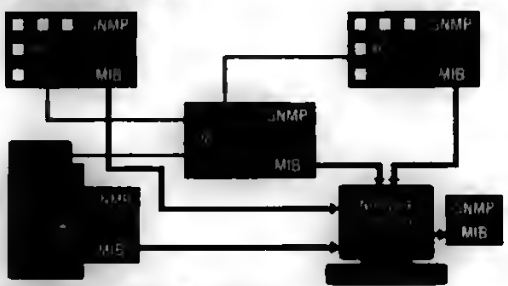
A more recent offshoot of SNMP is Rmon, a remote monitoring capability that gives a network manager the ability to monitor subnetworks as a whole, rather than just individual devices.

The more powerful and secure Common Management Information Protocol (CMIP), developed in the mid-1990s, was expected to replace SNMP. However, the fact that CMIP uses 10 times the network overhead has meant that SNMP is still the major player in the industry.

Despite its innocent-sounding name, SNMP isn't simple. It's a highly complex protocol that can be difficult to implement. Also, SNMP isn't very efficient. It wastes considerable bandwidth relaying unnecessary information, such as the version number, which is included in every message.

But one thing that sets SNMP apart from so many other standards is that it's not a mere paper specification but is widely available and interoperable among a variety of network components. ◗

How SNMP Works



- Black lines are normal network connections.
- Gold lines are SNMP agents getting PDUs and storing them in the MIB.
- Red lines are SNMP agents forwarding MIB data to the network management station, which stores them in its own composite MIB.

What Does SNMP Say, And Why?

Previously what sort of information is collected from agent devices is server-based on the type of device it is. For example, Cisco Systems Inc. in San Francisco offers SNMP management software for its Apache Web server that can monitor the following functions and events:

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DOCUMENT ACCESS: How many times are specific documents accessed or downloaded? This can immediately identify suddenly popular content – following a mention on national television, for example – and could tell you if you need to serve those pages from additional servers.

NUMBER OF CONNECTIONS: By letting you know how many active connections are maintained, as well as the cumulative total of connections, you can determine when your network is being overly stressed and whether people are able to access your site.

ERROR CODES: If a user gets an HTTP error message such as the standard "Page Not Found" or "Service Unavailable," the network administrator can be alerted.

– *Russell Kay*

Kay is a freelance writer in Worcester, Mass. Contact him at russkay@charter.net.

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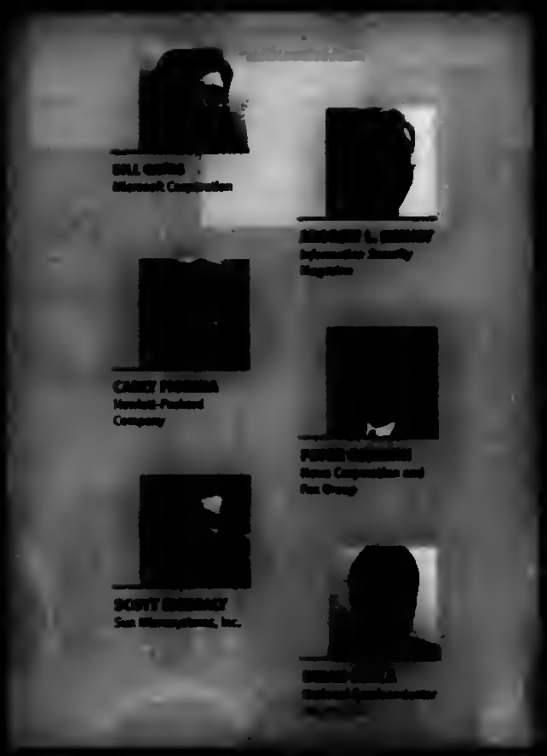

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Monitoring application performance can mean happier end users, but end-to-end visibility remains elusive. By Bob Violino

PHILIP ANDERSON

IF BOTTLENECKS AND BUGS in your systems were frustrating employees and annoying customers, would you eveo know? Or would you be oblivious?

Realizing that it's better to have some visibility into the end-user experience, many IT managers are turning to application performance management (APM) software and services. APM allows managers to keep tabs on how well Internet and other applications are working by continuously monitoring end users' experiences. The products and services can measure the performance of a Web site or an application in terms of response time and availability, ideotify the cause of trouble and ofteo recommend fixes.

APM software and services began to appear in the late 1990s, as demand grew for tools that could give managers a user's-eye view of applications. Most of the systems management products introduced earlier in the decade monitored things like network and database availability but didn't measure how applications were performing and how well they were supporting business processes.

With APM tools, IT managers can determine whether an applicatioo or a Web site isn't performing well. Because a high level of performance of many applications is critical for business, industry experts expect growing demand for APM offerings and similar products.

Continued on page 52

See What Users Really See

See What Users Really See

Continued from page 50

Numerous vendors are trying to address the demand, offering products that monitor everything from search engines to enterprise resource planning software. Technology managers are generally pleased with the products' ability to manage applications, though they say there's room for improvement.

But what the software does, it does very well, users say. The Detroit Medical Center, which encompasses seven hospitals, two nursing centers and more than 100 outpatient clinics in the Detroit area, is using APM software from Compuware Corp. in Farmington Hills, Mich., to monitor and manage multiple Windows and Web applications running on its clinical information system database. The clinical system runs the business processes for all the medical center's departments and is accessed by about 8,200 users, including physicians and nurses.

The APM software allows managers to track performance, response times and availability for front-end applications running on the network, as well as the database servers they're linked to, says Joe Francis, director of applications. The software "tells us exactly what the users are experiencing, how long response times are and when the application is down," he says. "We're able to tell whenever there are changes from a performance standpoint."

Identifying Trouble Spots

Insurance company Metropolitan Life Insurance Co. in New York is also relying on APM, using software from Mercury Interactive Corp. in Sunnyvale, Calif., to manage insurance and financial applications running on its Metlife.com site that are used by its customers and salespeople.

"As MetLife has moved toward Web applications, there's a need to understand what our internal and external end users are experiencing so we can better meet our service levels," says Bob Zandoli, vice president of network and distribution services. "The view has to be end to end with all transactions; we need to be able to mimic the customer's experience."

Mike Altiero, director of enterprise systems management at the insurance company, says if applications don't respond to users' needs quickly enough, the software identifies the failing component.

"We feel like we have a good handle on any performance or availability issues caused by Internet-related problems," Altiero says. "What [APM] doesn't tell us is if a user is having some kind of local access problem." MetLife uses other software tools to monitor such traffic flow problems, he says.

Zandoli says the company will expand its use of the Mercury APM product to monitor business process applications such as human resources and finance.

National Rural Telecommunications Cooperative (NRTC), a Herndon, Va.-based organization that includes more than 900 utilities serving 48 states, is already employing APM products to manage financial and infrastructure applications. Joe King, director of systems services, says the NRTC uses products from BMC Software Inc. in Houston and Oracle Corp. to monitor the performance and availability of its enterprise network and Oracle financial applications.

"We try to use these tools proactively, to identify and resolve performance problems before the end user sees them," says King. "We do this by setting parameters so that we're notified before the end user sees an application crash or has any other problems." The NRTC also uses APM for ongoing monitoring of network and application performance.

King says it's difficult to measure the return on investment of APM tools, but the tangible benefits are consistent application performance and overall improvements in users' experiences. "If the users are happy, then it's a great thing," he says.

What's Missing

While many managers are pleased with the ability of APM tools to monitor applications, some managers and analysts say vendors need to add capabilities to their products.

Detroit Medical Center's Francis says he would like to see new features that allow IT managers to create more useful trend information.

"We're capturing huge amounts of raw data as we monitor all these applications, but we need some kind of decision-support mechanism that allows us to easily graph the data so we can recognize usage trends," Francis says. "We're doing some of that now, but this is an area that needs to grow."

Foote, Cone & Belding (FCB), an advertising agency in New York, uses APM tools to monitor which applications are running on desktops, to ensure that the company has the right number of software licenses. Vijay Sonty, chief technology officer at FCB, says APM vendors must develop more tools that work across different computing platforms. He says he would also like to see more Web-enabled APM so applications can be managed remotely.

"Now we have to load the software on one machine that acts as the administrator," Sony says. "We'd like to see APM products that are browser-enabled so we can use PDAs to monitor applications when we need to."

The 'Pipe Dream'

Vendors are striving to provide as complete a view of applications as possible so managers can quickly find and fix virtually any performance problem. But some experts doubt that they will ever be able to provide effective end-to-end monitoring of applications, because there are too many variables in how users perform tasks and because of the way some business applications are designed.

"You can get into trouble when you're dealing with complex applications," says John Meyung, chief technology officer at Hudson Williams Inc., a management and technical consulting firm in New York. "People think things work a certain way, and the tools may not see what's actually going on physically. That's where you have to dig deeper into the application to determine what's really going on.

"Looking from one end of an application to the other and drilling down into it with a reasonable expectation of success in identifying problems is still a bit of a pipe dream," Meyung says, "although we can see a lot more from the end-user point of view than we could a few years ago."

Dennis Drogseth, vice president of consulting firm Enterprise Management Associates Inc. in Boulder, Colo., says the APM market is still new and evolving. "We're going to eventually see vendors come in and say they can manage the infrastructure and all applications," he says. "That's where the industry is going, and the reason is the increasing demand to better manage all business processes."

For now, most managers think APM is only part of the solution to ensuring continuous, high-quality performance of applications and networks.

"No one tool solves all our problems," says Zandoli. "We're looking at all the tools that work together so we can better manage the entire enterprise." ◗

Violino is a freelance writer in Massapequa Park, N.Y.

Application Performance Management

1. **ALLOWS** managers to keep tabs on how well Internet and other applications are working, by continuously monitoring end users' experiences.
2. **MEASURES** an application's performance in terms of response time and availability.
3. **IDENTIFIES** the cause of trouble and sometimes recommends fixes.
4. **KEEPS TRACK** of which internal users have access to particular applications.

HOW AMAZON.COM DOES IT

One of the best-known Internet businesses is relying on APM technology to keep transactions moving along smoothly – and keep customers happy. Read the story at *Computerworld.com* to find out more.

QuickLink 31762
www.computerworld.com

The Network Troubleshooters

What you need to know to land a job and keep your skills fresh. By Sharon J. Watson

Employee Spotlight

CAREERS

- **Name:** ZAK SPECK
- **Title:** Senior network administrator
- **Employer:** Kanbay Inc., a global systems integrator in Rosemont, Ill.
- **30-second résumé:** Launched career in 1990 as help desk staffer, built and repaired PC clones and maintained peer-to-peer networks. Moved on to junior network administration posts, continually earning certifications while applying for increasingly senior positions.

Joined Kanbay about nine months ago. Heads global virtual network teams with employees in Australia, India, Singapore, Hong Kong and the U.S., focusing on global servers and electronic communications. Day-to-day responsibilities include maintaining server infrastructure, disaster recovery, server hardware and software upgrades and assisting the help desk. Also manages and mentors team members.

- **Skills boost:** "I've gained most of my knowledge through hands-on experience," says Speck. "I've worked with people fresh out of school who took an engineering course, and they have a hard time doing the simplest tasks." He also hones his skills in Kanbay's lab, where he tests a variety of leading-edge products and systems.

Speck has been involved with Kanbay's global rollouts of Windows 2000 and Exchange 2000, video servers and internal instant messaging. He's also working with Microsoft Corp.'s Active Directory Server, the backbone of Kanbay's new network infrastructure. Speck says he expects that experience will become increasingly important.

Whether upgrading or troubleshooting, Speck's main goal is to make sure the network is transparent to users. The time he spent on the help desk at the beginning of his career has been invaluable there. "Knowing what users expect from the network helps you in the server room," he says.

– *Watson is a freelance writer in Chicago.*

MARC BELSON

Skills

- **A basic portfolio** of technical skills should include a solid understanding of IP, subnetwork masks, routing, Open Systems Interconnection layers, switching, routing protocols, gateways and security. Some programming ability can be a big plus.
- **Hot skills** cited by administrators include security, wireless networking, virtual private networks and voice over IP.
- **Bonus tip:** The ability to solve problems quickly and creatively is essential, administrators say. "Problem solving is 99% of what we do," says Matt Fahmer, manager of networking at Burlington Coat Factory Warehouse Corp. in Burlington, N.J.

Training

- **Prospective employers** say they look for network certifications – but they also view them with a dose of skepticism, so expect to be asked to demonstrate your skills during the interview process.
- **Sources of training** and information include vendor certification programs from Cisco Systems Inc. and Microsoft, user groups and conferences like LinuxWorld.
- **Hands-on practical experience** is essential. If nothing else, administrators urge beginners to set up a home network or solicit network internships.

Salaries

- Salaries vary widely depending on the responsibility level of the position. Junior administrator positions, which often include help desk work, range from $35,000 to $45,000. Midlevel positions range from $45,000 to $75,000. Administrators with experience and technical skills specific to a particular IT organization or with network engineering expertise typically earn $75,000 to $100,000 or more.

Is It Hot?

Network technology is continually advancing, with wireless networks already here and optical networking on the horizon.

Network management personnel say the toughest competition will be for entry-level and junior positions; experienced senior network administrators are the hardest to find. Those with security, wireless and voice over IP skills will be in great demand, according to prospective employers.

Best Place

Aetna Inc.
Hartford, Conn.
www.aetna.com

- **A health care insurance provider**
- **Ranked No. 49** on *Computerworld*'s 2002 Best Places to Work in IT list
- **2001 revenue:** $25.2 billion
- **Number of IT workers:** 3,000, supporting 40,000-plus network users
- **Manager's view:** Because Aetna's network is a "key, critical environment" for the success of the company's business strategies, network administrators and other networking personnel are carefully nurtured and managed as key players, says William Davis, manager of network and desktop engineering at Aetna.

"We're good about working with individuals to help them meet their career goals," says Davis. The company offers extensive training and mentoring and well-defined career paths, enabling professionals from other IT areas to move into the networking field and helping junior and midlevel networking professionals gain additional skills. Senior network administrators are rotated through various positions, giving them opportunities to work with the latest technologies.

Because Aetna has a detailed, long-term network plan, it can forecast what skills it will need and match those to the interests of its network professionals. "We try to prepare those avenues and open paths for an orderly transition," Davis says.

CAREER DILEMMA

Are you a jack-of-all-trades and master of none? IT managers offer advice on specialization vs. cross-training in the network management field.

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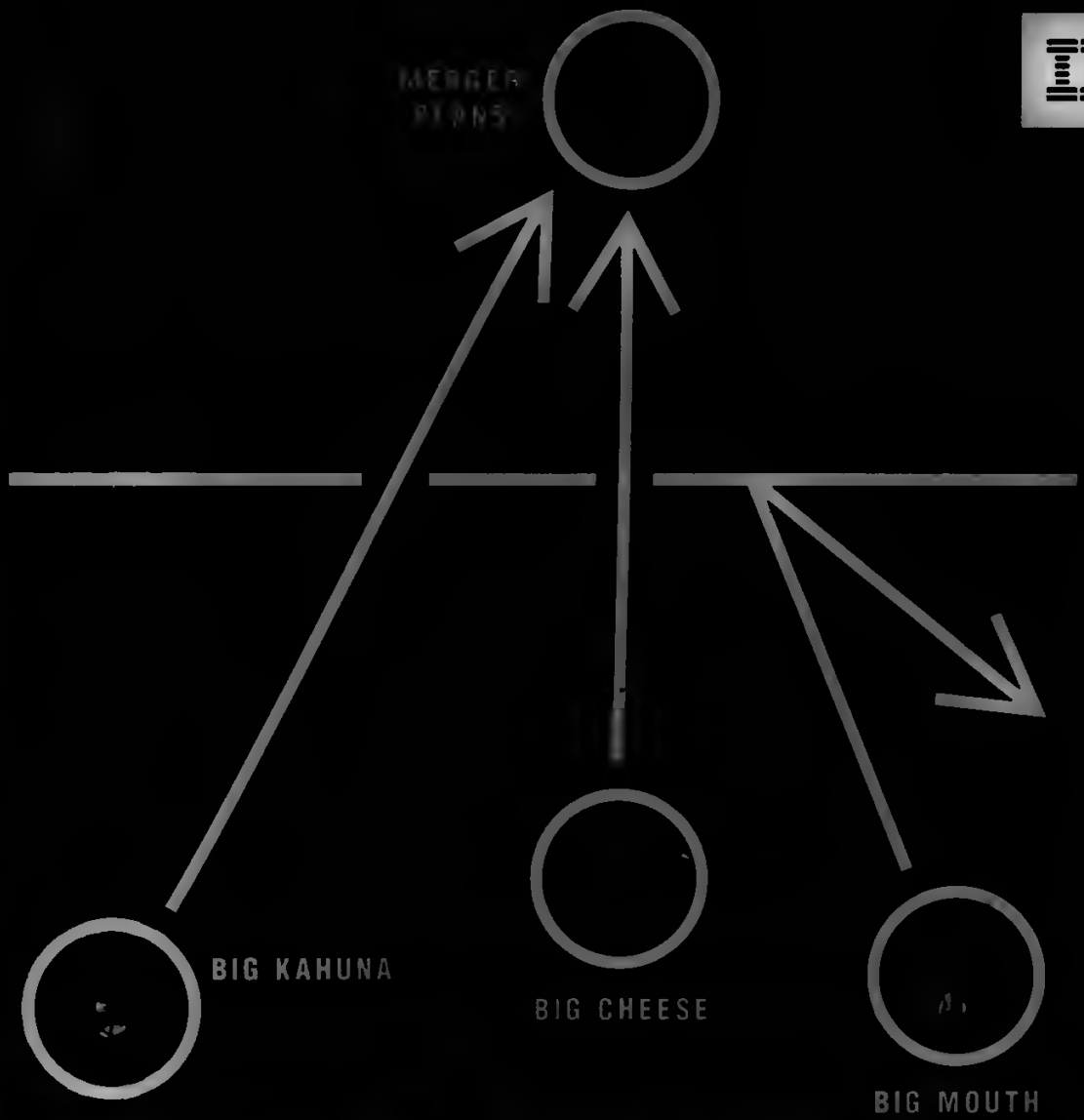

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The Next Chapter

Predictions: Soon we'll manage corporate networks remotely via PDA. But Web services will be the next management nightmare.

Hands-off Server Management

As the number of servers in the data center grows from 20 or 30 to literally thousands, "companies can't afford to have one system administrator managing three machines anymore," says Donna Dillenberger, a senior technical staff member at IBM Research in Hawthorne, N.Y.

So IBM Research has developed "self-learning" software that enables thousands of servers to basically manage themselves – and meet response-time goals – without human intervention. In other words, one systems administrator could manage, say, 2,000 servers instead of three or four, Dillenberger says.

Here's how it works: The administrator identifies different categories of business workload and the server response time that class of work needs. For example, a financial institution might decide that pension-fund traders need an end-to-end response time of five seconds, while individual stock traders need a response time of six seconds.

The Enterprise Workload Manager monitors all of the servers and makes adjustments in memory and in network and server resources every 10 seconds to make sure each class of user gets the desired response time.

"It's not dictated by a human. The software adapts the resources to the workload that's coming, whether it's a spike or a shift to a different class of work," Dillenberger says. "This is software that learns the right combination of resource settings for the desired performance goals."

How? Using adaptive algorithms, the software "learns the resource requirements for long-running jobs, for short jobs that are transaction-oriented, for jobs that are interactive, for jobs that are I/O-intensive," Dillenberger says.

And, unlike a human, the software never gets tired or takes its eyes off the screen.

Dillenberger says the product, which has been under development for two years, will be released for beta testing in November. General availability is scheduled for the first quarter. The workload manager is part of IBM's eLiza project for autonomic computing [QuickLink 29448].

–Mitch Betts

■ WEB SERVICES ALERT

In two years, system and network administrators will be required to maintain all the systems they do today, plus new technologies such as Web services and collaborative communication services. It will be like an auto shop that has to maintain Model Ts and Formula One race cars and everything in between. This will add a tremendous burden to IT administrators. Just when they have more to support than ever before, they'll also be supporting systems that are critical to business revenue. Smart IT managers will start investing now in the tools and talent they need to meet these challenges.

■ *Sheldon Laube, chairman, CenterBeam Inc., Santa Clara, Calif.*

■ BANDWIDTH HOGS

The old rule that 10% of the staff uses 90% of the resources has become an understatement. Now it's more like 1% of the staff that uses 99% of the resources, and it will only get worse. The problem lies in the fact that organizations are attempting to address the social problem of network abuse through technical means, which is doomed to fail. As fast as companies can institute monitoring software, individuals will find ways around it.

The answer lies in education: making employees understand how their actions are hurting the organization and what the consequences will be as a result. Until companies recognize this fundamental idea, bandwidth hogs will always be a problem.

■ *Jonah Yokubaitis, CEO, Texas.Net Inc., Austin, Texas*

MORE PREDICTIONS

Is SNMP doomed? Will IM be bigger than e-mail? Read more prognostications online:
QuickLink 32343
www.computerworld.com

■ ROGUES LOCKED OUT

In an effort to help IT departments with troubleshooting, Microsoft will add an option to the corporate versions of Windows 2000 and Windows XP Pro that prevents the installation of a noncertified driver. Microsoft will also add an option to lock the registry so that nonapproved software can't be installed.

■ *John Parkinson, chief technologist, Cap Gemini Ernst & Young US LLC, Rosemont, Ill.*

■ MANAGEMENT BY PDA

In the next few years, personal digital assistants and instant messaging will become the medium of choice for managing corporate networks. IT managers will be freed from the network operations center so they can handle other pressing issues in the field. Mobile IT managers will be able to receive alarms and network graphics and then initiate a troubleshooting sequence from their PDAs, using a stylus and an embedded instruction set.

■ *Bruce Rusch, CEO, Almeric Networks Inc., North Andover, Mass.*

■ WE HAVE HOW MUCH?

Businesses deploying next-generation asset management tools will discover that they actually own about twice as much technology as they thought, that most of it is obsolete but not yet depreciated and that the write-off required by new accounting standards will cause another slump in tech spending.

■ *John Parkinson, Cap Gemini*

■ THE FUTURE OF HELP DESKS

The Remote Assistant features of Windows XP will lead to a dramatic increase in the centralization and outsourcing of help desk support. By allowing help desk technicians to connect to troubled PCs remotely, the Remote Assistant obviates the need for on-site support for the most frequent user issues. As the Remote Assistant gains widespread acceptance, Remote Assistant user request and help desk response information will be integrated into help desk software packages, allowing for more complete and accurate help desk metrics. This in turn will allow organizations to get a better grasp on service-level agreement performance. The combination of these features will finally make help desk outsourcing and departmental chargeback widespread realities in corporate IT.

■ *Jacob Cane, principal, Business Technology Partners Inc., New York*

■ WELCOMING NETWORK VISITORS

In the next two years, companies, colleges and universities will focus on visitor-based networks, or VBNs, as a way to improve customer relations and maintain a competitive advantage. VBNs allow all visitors to your network to get their e-mail and surf the Web — but they won't have permission or rights to log onto the organization's internal network. It's a way of "making your customers' day" by giving them high-speed bandwidth so they can conduct business while on your network. A smart network, with managed network authentication, can give full rights to employees and limited rights to visitors. This will be a hit in the wired and wireless worlds.

■ *Brian Young, CIO, Hobart and William Smith Colleges, Geneva, N.Y.*

To our customers: Thanks for making IBM the world leader in database software. How did this happen? By providing performance and value across platforms including UNIX,® Windows® and Linux.® The leading application providers: Ariba, i2, J.D. Edwards, PeopleSoft and SAP all agree. DB2 is how you win the game of e-business. DB2. Part of our software team including Lotus,® Tivoli® and WebSphere.® Visit **ibm.com**/db2/win

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- **Design Automation User Interface Engineer**
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The aforementioned positions are available at all levels and require a minimum of a B.S. or M.S. in Computer Science, Engineering, Math or a related degree and 0-5 years experience with MATLAB, Simulink, RTW, Controls, or DSP Environments.

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SOFTWARE QUALITY ANALYST & DATABASE ADMINISTRATOR

ADT Security Services, Inc., the leading electronic security services company, has immediate openings in as Boca Raton office for experienced Software Quality Analysts and Database Administrators.

Software Analysts will analyze system integration and compatibility issues with business analysts and development teams, design and write procedural documents, analyze software functionality versus business process issues and work with users during training.

DBAs will be responsible for the administration of several production and development databases; analyze database requirements of user departments, design, develop and modify tests and debug databases.

Software Quality Analysts and DBAs must possess a bachelor's or its equivalent in computer science, engineering or a related technical field and relevant work experience. Work experience for Software Quality Analysts must include Oracle Applications /Databases/Tools and PL/SQL and writing and maintaining automated test scripts.

Work experience for DBAs must include Oracle database administration tools and techniques, Windows 95/98, SQL, UNIX (including shell script programming, shell interfaces and basic system administration) and with the configuration performance tuning, maintenance, planning and design of databases.

Resume and/or cover letter must reflect each requirement above and specify reference code SQA/DA or it will be rejected.

Forward resume to Theresa Mass, ADT, One Town Center Road, Boca Raton, FL 33486-1010.

Sr Web Developer-At Quest Diagnostics, Inc, we've become the nation's most respected name in diagnostic testing by focusing on integrity, innovation & quality. We've created an environment where dedicated professionals can learn, grow and advance-all in an atmosphere of pride.

We're currently seeking a Sr Web Developer to be based in Lyndhurst, NJ. Candidate will design database models, business and presentation logic for providing online diagnostics to clients & research and develop complex web applications. Requirements: Bachelor's degree in Computer Science, Electronics, or related field, 4 years experience in OOAD/OOP RDBMS, JAVA and web-based development. Knowledge of 3-tier architecture and development of complex web applications and corporate web sites also required. EOE/M/F/D/V.

Please add source code: SWDJG and forward your resume to: Email: questdiag@ddsus.com, Fax: 877-596-9942 or mail to Quest Diagnostics Incorporated, PO Box 3597, Scranton, PA 18505

Programmer Analyst 8a-5p. 40 hrs/wk. Analyze, dsgn, dvlp, prgm & implmt business applics using Oracle, C, C++, PowerBuilder, Win & UNIX. Educational Reqmts: Bach or equiv degree in Electrical or Electronics Engg, Comp Sci/Engg, Mgmt Info Syst, Business Admin or related field. Exp Reqmt: 2 yrs in job offd or as Systms Analyst/Systms Executive or Prgmr. Resume: Avalon International, Inc., 3550 Engineering Drive Ste 260, Norcross, GA 30092.

Project Managers for IT Co. in Nashua, NH. Plan, review, coord & manage activities of designated proj to ensure dvlpmt & implementation of proj dsgn, using either of following skill sets: 1) COBOL, Oracle, UNIX, NT platforms, Project Mgmt Tools like MS Project, MS Word, MS Excel & MS PowerPoint 2) VMS, DECNET, VAXCluster, Fortran. Also oversee custom installation, involve in work plan; staffing & recruitment of pers & proj budget. Prep proj reports for mgmt & maintain dbases. Masters or equiv in Sci or Physics or Comp Sci or Bus Admin + 3yrs exp or Bach or equiv + 5yrs progressive exp. in duties listed. Respond to Datamatics (America) Inc., 20 Trafalgar Square, #445, Nashua, NH 03063. Fax 603-598-1227. e-mail: datamj@datamatics.com

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F/T Application Developer: Responsible for the research, design, development, testing, maintenance & deployment of software applications & working w/ system development & integration methodologies. Communicate effectively w/ external & internal customers. Work w/ mainframe including COBOL, IMS, Assembler, Easytrieve, Mark IV JCL & client server programming technologies such as Visual Basic & C++. Must have Bachelor's degree in Computer Science or related field. Educational & or work background must have included the above reference skills. Send resume: AFLAC c/o Catherine H. Coppedge 1932 Wynnton Road, Columbus, GA 31999.

SYSTEMS ANALYST-Quantitative- based financial management firm seeks Systems Analyst to provide software support & database management for computer-driven trading & accounting systems in a networked Sun/Solaris UNIX environment. Duties include software development, maintenance & testing for equities database & various reporting programs. Successful applicants must have Master's in Computer Science & at least one year experience in job duties or one year exp. as Systems Analyst/Software Engineer. Salary according to experience. Mail resume to RTC, 600 Route 25A, East Setauket, NY 11733. Attn: RMSB

Programmer: Works under the supervision of Sr programmers to convert project specs to create /modify computer programs; develop programs to manipulate data using AWK/C/Basic; develop test procedures/software; increase program operating efficiency; document program development. Req: Bach in Comp Sci reqd/equiv and 1 yr exp or 3 work exp may be substituted for req of Bach & 1 yr exp. Resume: HR, The USA Bouquet Company, 1500 NW 95th Ave, Miami, FL 33172.

Vice President, Optoelectronics Division: Build lead & manage Cree's Optoelectronic Semiconductor business unit to meet business objectives, and build and manage marketing team. Plan, coordinate and manage product development activities w/ R&D and manufacturing organizations to meet business objectives. Drive and manage introduction of new products. M.S. in Eng., Physics, or related, +4 yrs. exp. req'd. $200,000/yr. Send resumes to HR Dept., Cree, Inc., 4600 Silicon Drive, Durham, NC 27703. No phone calls please. EOE M/F/D/V

SOFTWARE ENGINEER-Quantitative-based financial management firm seeks Software Engineer for its Production department. Duties include: develop & maintain computer links between futures trading system & trading desk; write new programs for real-time data area & real-time systems, including programs to handle real-time aspects of data feeds & serving data in real-time to (program) clients; create/verify mathematical trading models for real-time trading systems. Successful applicants must possess Master's in Computer Science, Mathematics or Physics & at least one year experience in job duties or one year experience as Software Engineer engaged in theoretical analysis. Salary according to exp. Mail resume to RTC, 600 Route 25A, East Setauket, NY 11733. Attn: GHEV

Development Manager: Design & develop computer programs. Train & Supv Programmer Analyst, consult w/clients. Manage multiple development projects. Write & maintain documentation, including logic, coding, testing & changes. Req. Bachelor's deg in Commerce, Bus Adm., or Computer Sci. & 2 yrs. exp. in job, or 2 yrs. as Systems Analyst, Programmer Analyst or related. Resume to: EPOS Corp., 177 Technology Pkwy., Auburn, AL 36831

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Programmer Analyst wanted by IT Co to engage in analysis, dsgn & prgmg of commercial applics, health care & telecommunications using ADABAS, DB2, INS DBMS & Natural 2.x, Natural 3.1.4 Construct SQL, COBOL languages. Must have BS & 5 yrs work exp. Work loc: Boston, MA 9a-5p. Email resumes to HR Dept at ai@aolgat.com

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QUALITY CONTROL ENGINEER- Quantitatively-based financial management firm seeks experienced Quality Control Engineer for its Database department. Duties include running estimations & simulations of market software, analyzing results & tracking unexpected results or bugs through complex mathematical algorithms requiring knowledge of linear algebra & advanced statistical methods. Successful applicants must possess Master's degree in Computer Science and at least one year experience in job duties or one year experience as Systems Analyst working with financial instruments software. Salary according to experience. Mail resume to RTC, 600 Route 25A, East Setauket, NY 11733, attn: RM.

FL Tech Co. seeks Programmer Analyst to plan, develop, test and document computer programs; evaluate user requests for new or modified programs, consult with user to identify current operating procedures and clarify program objectives, formulate plan outlining steps required to develop program, using structured analysis and design; enter program codes into computer system and analyze, review, and alter program to increase operating efficiency. Min req. 4 yrs. in job or job related exp to include knowledge of theoretical and practical application of computer systems and programming. Resumes to Dir. of Oper., 1638 E. Atlantic Blvd., Pompano Beach, FL 33060. No calls. EOE

Software Developer. Develops software or telecomm./business applic's; determines feasibility of design within time/cost; evaluates interfaces between hardware-software/performance requirements, measures design outcome, develops/directs testing procedures, programming/documentation. uses T-SQL, MS SQL Server, MS Visual Studio, MS Visual Basic, COM/DCOM. Req. Bach. in Comp. Sci. rel./equiv. & 2 yrs. exp. Resume to K. Baker, Radiant Telecom, Inc., 1020 N.W. 163rd Drive, Miami, FL 33169

Programmer Analysts needed for multiple openings in Portland, Maine. Requires 3 years programming experience. Send resumes to Lois Judge, c/o Unum Provident; 2211 Congress St., Portland, ME 04122. Refer to job code BDBC.

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Programmer Analysts (multiple positions) sought to undertake software programming projects /assignments by computer s/w consultancy firm in Satellite Beach, FL. Must have Bach or equiv in Comp Sci Engg or equiv & 4 yr exp using VB, ASP, ADO, CDONTS, VBA Remote Scripting, MTS, COM, DCOM, Cold Fusion and Ingres. Respond to. HR Dept., Infinity Software, Inc., 659 Loggerhead Island Dr., Satellite Beach, FL 32937

Programmer/Analysts wanted by IT co in NYC to develop, enhance, implement & maint asset/equity mgmt softwr. VB, Crystal Reports, ASP, HTML, COM+ & JavaScript. Resumes to Vitech Systems Group, 401 Park Ave So, NY, NY 10016.

Computer Programmer (based in Atlanta GA and work at client sites throughout U.S.): Utilize Cobol, DB-2 and JCL for business applications. Plan, develop, code, test and document programs. Determine user requirements. Develop plan for programs, using structured analysis and design. Req. Bachelor of Sci. in Comp. Sci. & 2 yrs exp. in job. Resume to World Link, Inc., 1750 North Collins Blvd., Suite 212, Richardson TX 75080.

INFORMATION SYSTEMS ADMINISTRATOR wanted by Transportation Mgmt agency in Jersey City, NJ to plan, design, implmt, administer & maintain info & communication systems incl telecommunications, LAN, WAN, web site & ITS. Must have Masters in Comp Engg, Electrical Engg or closely related & 2 yrs exp. Respond to HR Dept. TRANSCOM INC., Newport Financial Ctr. 111 Pavonia Ave, 6th Fl. Jersey City, NJ 07310-1755

Market Research Analysts needed: Seeking candidates possessing BS or equiv and/or rel. work exp. Duties include: Perform market analysis to determine markets & trends. Analyze market dynamics in order to characterize opportunities and market shifts. Assess market capabilities based on market attractiveness, competitive positioning, strategic positioning and gaps in market and or offerings. Mail resume, ref. transc. & sal. req. to State Farm Insurance, 5196 Lee Road, Maple Heights, OH 44137

Software Architecture Analyst-(Trumbull CT) Develop design & modify software solutions, applications & specialized utility programs. Coordinate GITS development & infrastructure group. Req'd: Master's deg in Computer Engg or related field & 4 yrs exp. as Applications Architect or related job. Must have exp. w/ Vignette Content Management system infrastructure & Oracle database. HTML web design & Java scripting. Send resume to General Reinsurance Corp. Financial Centre, 695 E. Main St., Stamford, CT 06901, Attr: C. Sullo

Infobahn Technologies delivers innovative IT solutions to business clients nationwide. We have immediate full time opportunities for Software Engineers. All applicants must have at minimum BS in Comp.Sci./ Engg. or related field plus 2 years of experience. Send resume to: Infobahn Technologies, (HR) 288 Walnut St. #410, Newton MA 02460

MBTI has opening for a Business Development Manager to manage & direct marketing & sales of our software services, identify business opportunities in telecommunications software development & maintain & develop existing client relations. MS/BS in Computer Science, Business or any Engineering field with relevant 3-5 years work experience. Send resume to MBT International, Inc., 1155 Kelly Johnson Blvd., Suite 111, Office #5 Colorado Springs, CO 80920.

Systems Analyst needed by IT Co. in Lawrenceville, NJ. Will dsgn, analyze & implmt computer applics using Astra & Astra Lite Cycle products. Will also provide customized svc for client server applics. 9a-5p. BS in Electronics & 2 yrs exp using Astra Lite Cycle reqd. Fax resume to HR Manager at (609) 912-0605.

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Applications Engineer. Perform CAE dsgn analysis on specific customer components &/or systems; recommend changes & analysis process implementations as needed; prep & present tech'l explanations of LMS CAE process solutions; provide tech assistance, training, & info on LMS CAE products; provide end-user orientation criteria to LMS Product Mgmt & Dvlpmt; assist in dsgn of LMS CAE products. Dsgn s/ware automated testing procedures. B.S. in Mech Engg, 1 yr exp in job offd, or as research or dsgn eng or similar duties under different job title, or equiv combo of edu & exp 1 yr exp or equiv education in CAD /CAE s/ware. FEA s/ware & modeling & s/ware dvlpmt 6 mos exp in parametric modeling demonstrated ability in written & oral tech'l communication. 40 hrs/wk, $42K/yr. Must have proof of legal auth to work in US. Send your resume to IA Workforce Center, 1700 S. 1st Ave, Ste 11B, Iowa City, IA 52244-2390. Please ref. JO#1101594. Employer paid ad. Equal Opportunity Employer

Full-time Programmer Analyst. Responsible for evaluating company's business and functional requirements and developing computer based applications according to established standards, needs and enhancement requirements. Conduct detailed analysis of all defined system specifications for changes in system requirements, customer requirements and equipment configurations. Design and prepare logic flow charts and complex computer programs. Provide technical support, perform unit testing, document results and troubleshoot defects found. Work with RPG/400, CL/400, SQL/400, UNIBOL, Unix and Visual Basic. Must have a Bachelor's degree in Computer Science, Computer Engineering or related field. Foreign degree equivalent accepted. Must have 2 years experience in job offered or position with same duties. Send resume to Natasha Lyttle, SITA INC. Ref. # UMES. 3100 Cumberland Blvd., Suite 200, Atlanta, GA 30339. SITA INC. is an Equal Opportunity Employer

Programmers, Jr Programmers, Software Engineers. Design, develop, test and implement specialized applications in (1) COBOL 78 & 85, DMSII, Dargal, BI Source, BLDIST, BLSched, ICD, Tads, MS Access, DB2, Cics, People Tools and SQL, (2) Oracle 8i, MS Access, C, C++, Java, VB, Arc Info, View, FM Mapinfo, Dream Viewer, Benchmarking, Six Sigma and SQC Tools (3) Sybase, Java, C++, COBOL, CORBA, Weblogic, MQ Series, Rational Rose, BEA Weblogic, and IBM Websphere. Prevailing wage/benefits. Send resume to Attn: Raja Narreddy, Quantum Infotech, Inc., 30800 Telegraph Road, Ste 2220, Bingham Farms, MI 48025. EOE.

Synova Inc is seeking professionals with the following skills: Programmer/System Analysts /Engineers in Mainframe, Clientserver, Datawarehousing, SAP-Technical/Functional, Peoplesoft, Java, Rational/RUP, UML, Websphere, Weblogic, J2EE, Unix, DB2, DBA / Oracle / SQL, DBAs. Respond to ads@synovainc.com. IT professionals wanted by Netsoft. Following skills are plus: Webmethods, e*Gate, e*Index, e*Xchange, C/C++, VB, Oracle, J2EE, IBM WebSphere. Candidates must have minimum BS degree in computer science or related field. Send resumes to hr@nstc.net or jobs@nstc.net

Sr Analyst Programmer, UMS

We seek an experienced software professional for ongoing development & support of LIMS software. Candidate must have Bachelor's degree in CS, CE or equivalent; must have minimum of 3yrs. of professional IT exp in developing LIMS in an Oracle database/UNIX environment, incl reporting tools, Instrument /Chromatography data systems (CDS) & working knowledge of Software Development Life Cycle (SDLC). Min 2yrs in PL/SQL programming & Oracle Forms version 3.0. Send resume to Jill Hansen, Avantis Behring L.L.C., 1201 N. Kinzie Bradley, IL 60901

Software Engineer. Design, implement healthcare apps in the development of Disease management systems using VB, ASP, VBScript, ADO, XML, COM+, HTML, IIS, SQL Server 7.0/2000, Visual Interdev 6, Visual Source Safe, Windows 2000. Prevailing wage/benefits. Send resume to Attn: Marty LeMasurier, Maine Healthcare Inc., 1850 Parkway Plaza, 12th Floor, Marietta, GA 30067

Senior Software Engineer (Peoplesoft Financials Technical Lead) (Cordova, Tennessee) - Technical lead responsible for all aspects of a legacy system conversion to Peoplesoft Financials ver. 8 in an Oracle/Unix environment. Responsibilities during this full-cycle implementation will include the design, development & customization of interfaces, on-line pages & reports. The lead will also develop & manage team work plans, provide quality control over all development activities & deliverables, & identify/ facilitate issues & resolutions. Must have BS deg. or equivalent with major field of study in Comp. Sci., Eng., or related field AND 3 yrs. of exp. in the job offered or 3 yrs. of exp. in a PeopleSoft Financials development position in an Oracle & Unix environment. Exp. mentioned may have been obtained concurrently & must include (i) 1 yr. exp. with Peoplesoft version 8 development, interfaces & reporting tools, & (ii)minimum 2 PeopleSoft implementations, including 3 full cycle PeopleSoft implementations involving legacy system conversion, customizations & interfaces. Must have legal authority to work in U.S. Please send resume to S. Muhammad, Unison Planner's Corporation, 7130 Goodlett Farms Parkway, Cordova, TN 38018

Programmer/Analyst. Design, implement and maintain WAN, LAN, and VPN using Cisco routers over Windows NT servers. Maintain B2B network to allow access for data exchange between Enertouch and its corporate clients, including remote access to SQL7.0 and databases. Req. BS or equivalent in CS w/9 months exp in job offered or as System Administrator. Must be Microsoft and Cisco certified and proficient in perl scripting, C++, java, SQL and VPN. $57450/yr. 40hrs/wk, 9-5. Send resume to Enertouch, Inc. at 1899 Parker Ct., Stone Mountain, GA 30087

Software Engineer

Prepares technical documentation for applications during development stage, writes reports on projects, reviews quality assurance process. Provides graphical and design duties on web applications that may require display on statistical and scientific data. Utilizes ASP, VBScript, JavaScript, COM+, XML and Visual Basic in developing and implementing software. Requires 2 yr. exp. in networking infrastructure, System Admin, Exchange Server, Visual Source Safe, Mail Admin, WebMail setup, SQL database, Crystal Reports, and Web admin; 1yr. exp with Biztalk Server 2000, Pinnacle Flippergraph ASP Macromedia, 2 yr. exp. of utilizing ASP, VB-Script, JavaScript, COM+, XML and Visual Basic in developing and implementing software applications (Fireworks, Dream weaver) ASP.Net, VB.Net, C# WAP and WML Script. Must have experience in providing training sessions for peers and customers and development languages and techniques. Requires bachelor's degree in computer science or related field. Send resume to Priority IT Inc. 10467 Town & Country Way, Houston, Texas 77024 Attn: HR Dept.

Multiple positions available for Network Engineers in an IT development and consulting firm located in Mountain View, CA. Job duties include: Engage in Local Area Network (LAN) Commissioning, LAN workstation configuration and LAN/WAN equipment installation including Ethernet, Token Ring Hubs and Switches for various clients located throughout the U.S. Applicant must have B.S. degree in computer science, engineering, business or math. Applicant must also have 1 yr. exp. in the job duties described above. Competitive salary. Send resumes to Ramy Jaleco, Augustinian IT, 170 Cottonwood Court, Mountain View, CA 94043

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Top information technology professionals look for four things in their employers:

- Access to challenging, diverse IT projects,
- Opportunities to move within company,
- Career management processes;
- Balance between people and company needs

These are the primary areas two companies on *ComputerWorld's* Top 100 U.S. Employers in IT list focus their energies when also discussing how they value diversity. **Household International Inc.** of Prospect Heights, IL (number 56 on the list) and **Mutual of Omaha**, based in Omaha, NE, and number 96 on the list, both believe in a continuous conversation with employees to stay on track.

Liz Mazzotta, vice president of corporate development and diversity at **Mutual of Omaha**, says the company is comprised of 66% female employees, 12 % minorities. **Mutual** uses a three-legged diversity approach – internal, community and education. Internally, the focus is on education and building careers. In the community, the company partners with Urban League of Nebraska among other career-focused agencies. And, on the education front, **Mutual of Omaha** is a leader in INROADS, a career development and intern program for minority students, as well as career development programming at North and South High Schools in Omaha, which have diverse student populations.

However, Mazzotta sees such programs as only part of the puzzle. In February the company began measuring workforce engagements through employee surveys. Managers then receive a scorecard on where their teams stand in terms of 12 metrics that relate to building an accountable and engaged workforce.

"These efforts are great assets for employees when paired with large-scale IT challenges that center on customer relationship management and data mining and warehousing," she says. The company has more than 900 IT professionals working on a mix of state-of-the-art and legacy systems. Most-sought skills include systems programming, advanced languages such as JAVA, and web enablement.

As with **Mutual of Omaha, Household International** is female-strong with 64% of the workforce female and 38% minorities. Al Crook, group director of human resources, says among the strongest reflections of the company's pride in diversity and individuals are events that employees plan – such as the multi-cultural fair held at the Wood Dale (IL) location when employees dress appropriate to their culture and bring foods to share with others.

This natural reflection of valuing diversity is based on something more basic, according to Crook. "We are a meritocracy that allows employees to come in and, regardless of personal situation, be measured by what they do. You can't change your demographics, but you can control your performance and that's what counts at **Household**," he explains. Along those lines, **Household** has a mentoring program to build employee success. The mentoring partnerships may involve people who are similar in culture or background – or not. "In the truest sense of valuing diversity, we have found that when you merge people who are different and who find they can learn and understand more through one another, then that's absolutely the best case," says Crook.

"One of our key strategic advantages is that we produce our financial services in one of the most efficient operations in the industry, and much of that efficiency comes from the use of technology," Crook says. The company recently completed a BranchNet project that links 1,700 branch locations through the largest integrated voice and data network in the industry and is upgrading operating systems.

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3925 Brookside Parkway
Apharetta, Georgia 30022

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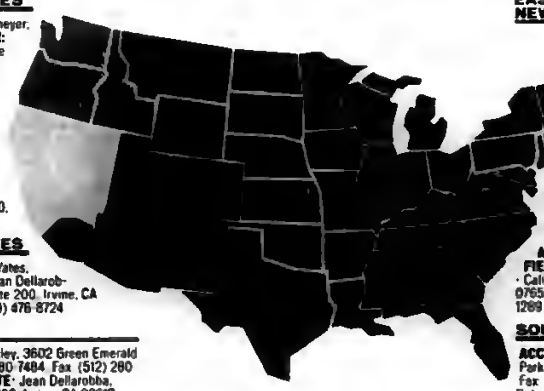

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Windows XP

Microsoft is focusing oo communicating the benefits of Windows XP to companies still running Windows NT, Windows 98 and Windows 95. Those benefits include improved stability and enhanced wireless and security management features, he said.

"Most enterprise customers still have held to the tradition of waiting until Service Pack 1 to even look at it," Cullinan said. "IT spending has dried up, and it looks a little bit tighter. But IT speoding should be on the rise in the coming months. We feel really good about where Windows XP is."

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Some Are Ready

But Bill Lewkowski, CIO at Metropolitan Health in Grand Rapids, Mich., saw a clear need for XP. Lewkowski said the vendors that make the applications his company runs will no longer be supporting Windows 95. "Since we held off oo Windows 2000 for a while, we deeided we might as well jump to the new version," he said.

Navigant International Inc., a travel services firm in Englewood, Colo., is in the same boat. "Some of our critical software vendors skipped formal Windows 2000 support and leapfrogged from Windows 98 to Windows XP," said Navigant CIO Neville Teagarden.

But more than half of the 25 companies surveyed last week said a majority of their end users still run Windows NT, Windows 98 or Windows 95. "We've been driven by what our vendors will support. So far, they all support Windows 98, so we stay with 98," said Bill Finefield, CIO at the Navy Exchange Service Command in Virginia Beach, Va.

Large companies face bigger obstacles to upgrading because of the sheer volume of PCs involved. KeyCorp, a Cleveland-based financial services firm, has migrated 11,000 of its PC users to Windows 2000, with hopes of moving its 8,000 Windows NT 4.0 users and 1,500 Windows 95 users by the end of 2003. The company has no plans to change its decision to make Windows 2000 its corporate desktop standard, according to Jeff Glover, vice president and manager of KeyCorp's desktop systems group.

Andre Mendes, chief technology integration officer at Public Broadcasting Service in Alexandria, Va., said he sees no need to move to XP, since Windows 2000 has been "unbelievably reliable" on his organization's 800 desktops. Its remote configuration and management features have also let him cut his help desk staff from five to two people, Mendes said. ◗

UPGRADE UNCERTAINTY

Analysts say it's unclear how quickly the pace of Windows XP upgrades will pick up.

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Windows Desktop OS Life Cycle Support

WINDOWS VERSION	END DATE STANDARD	END DATE [illegible]
Windows 95		
Windows 98		
Windows NT 4.0		

Microsoft Ships Windows XP Service Pack

Microsoft's first service pack update for Windows XP, released last week, contains some new features and enhancements beyond the usual bug and security fixes.

Service Pack 1 (SP1) gives computer makers and users the ability to remove access to certain middleware programs, such as Microsoft's Web browser, media player, e-mail and instant messenger clients as well as its Java virtual machine (JVM) code.

All of those programs - except the JVM - come installed with Windows XP. But as part of its effort to comply with the proposed antitrust consent decree that it signed last November, Microsoft has built in options so that users can change those settings.

The JVM software, which had been eliminated from Windows XP, will now ship with SP1 as part of the default installation. Microsoft has said that it made that addition in response to a lawsuit filed by Sun Microsystems Inc. but that its long-term plan is still to remove Java support from Windows releases.

Other updates in SP 1 for Windows XP include the security fixes that Microsoft has developed as a result of its Trustworthy Computing initiative.

Typically, the release of the first service pack serves as a milestone for corporate users who are hesitant to deploy new Microsoft operating systems. But Michael Silver, an analyst at Gartner Inc., said he doesn't expect this one to have a big impact on corporate users, since the desktop operating system was "pretty stable" to begin with and was only an incremental upgrade over Windows 2000.

Users can download SP1 for Windows XP from Microsoft's Web site for free, or they can order a CD and pay the $9.95 shipping cost.

- *Carol Silva*

Continued from page 1

CSC Contract

this as rumor and speculation, and as a matter of policy we doo't comment on that," he said. UTC, a Hartford, Conn.-based conglomerate that had $27.9 billioo in revenue last year, also wouldn't comment.

But the CSC technician said the two companies appear to be engaged in a game of financial brinkmanship. "They cannot agree on the money, and neither side is willing to back down," be said. "It's like [CSC officials] wanted the contract so bad, and now they may not be able to live up to it."

Another person close to the situation said it isn't so much that CSC underbid the original contract. The issue, he said, is that the outsourcing vendor hasn't fully achieved expected savings in operating costs by consolidating UTC's IT facilities and automating functions such as data backup and remote PC management.

Peter Bendor-Samuel, president and CEO of Everest Group Inc., a Dallas-based outsourcing consulting company, said he's familiar with the current friction between UTC and CSC. Bendor-Samuel said such disagreements are common oo deals that result from highly competitive bidding processes.

"The investment banking term for this is *the winner's curse*," he said. "It was a fiercely competitive deal. [For UTC] it was go at it and drive down the price through bidding. That then put them in this death spiral when CSC made some bad assumptions."

The contract was initially signed in May 1999 as a 10-year, $1.2 billion deal between El Segundo, Calif.-based CSC and UTC's Pratt & Whitney aircraft engines subsidiary. The agreement was expanded that fall to cover all of UTC's North American IT infrastructure and was extended by another five years last November.

As part of the contract, CSC is standardizing about 45,000 PCs throughout UTC's operations, adding new IT management software and consolidating the company's data centers, servers and help desk operations (see box).

During an interview in June, UTC CIO John Doucette emphasized that it was CTC's responsibility to spend money on technology, such as Veritas Software Corp.'s NetBackup tool, in an attempt to further automate UTC's operations and "thus reduce cost."

Bendor-Samuel said one or two outsourcing megadeals end up in similar situations each year because it's nearly impossible to predict the long-term costs of technology and IT services. But the vast majority of conflicts are resolved before deals fall apart, be added.

"The cost of failure here is too great for both companies," Bendor-Samuel said. "What often has to happen is they have to play out the emotion before [a resolution] can happen." ◗

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Navigant International Inc., a travel services firm in Englewood, Colo., is in the same boat. "Some of our critical software vendors skipped formal Windows 2000 support and leapfrogged from Windows 98 to Windows XP," said Navigant CIO Neville Teagarden.

But more than half of the 25 companies surveyed last week said a majority of their end users still run Windows NT, Windows 98 or Windows 95. "We've been driven by what our vendors will support. So far, they all support Windows 98, so we stay with 98," said Bill Finefield, CIO at the Navy Exchange Service Command in Virginia Beach, Va.

Large companies face bigger obstacles to upgrading because of the sheer volume of PCs involved. KeyCorp, a Cleveland-based financial services firm, has migrated 11,000 of its PC users to Windows 2000, with hopes of moving its 8,000 Windows NT 4.0 users and 1,500 Windows 95 users by the end of 2003. The company has no plans to change its decision to make Windows 2000 its corporate desktop standard, according to Jeff Glover, vice president and manager of KeyCorp's desktop systems group.

Andre Mendes, chief technology integration officer at Public Broadcasting Service in Alexandria, Va., said he sees no need to move to XP, since Windows 2000 has been "unbelievably reliable" on his organization's 800 desktops. Its remote configuration and management features have also let him cut his help desk staff from five to two people, Mendes said. ◗

UPGRADE UNCERTAINTY

Analysts say it's unclear how quickly the pace of Windows XP upgrades will pick up

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Microsoft Ships Windows XP Service Pack

Microsoft's first service pack update for Windows XP, released last week, contains some new features and enhancements beyond the usual bug and security fixes.

Service Pack 1 (SP1) gives computer makers and users the ability to remove access to certain middleware programs, such as Microsoft's Web browser, media player, e-mail and instant messenger clients as well as its Java virtual machine (JVM) code.

All of those programs – except the JVM – come installed with Windows XP. But as part of its effort to comply with the proposed antitrust consent decree that it signed last November, Microsoft has built in options so that users can change those settings.

The JVM software, which had been eliminated from Windows XP, will now ship with SP1 as part of the default installation. Microsoft has said that it made that addition in response to a lawsuit filed by Sun Microsystems Inc. but that its long-term plan is still to remove Java support from Windows releases.

Other updates in SP 1 for Windows XP include the security fixes that Microsoft has developed as a result of its Trustworthy Computing initiative.

Typically, the release of the first service pack serves as a milestone for corporate users who are hesitant to deploy new Microsoft operating systems. But Michael Silver, an analyst at Gartner Inc., said he doesn't expect this one to have a big impact on corporate users, since the desktop operating system was "pretty stable" to begin with and was only an incremental upgrade over Windows 2000.

Users can download SP1 for Windows XP from Microsoft's Web site for free, or they can order a CD and pay the $9.95 shipping cost.

– *Carol Silva*

Continued from page 1

CSC Contract

this as rumor and speculation, and as a matter of policy we don't comment on that," he said. UTC, a Hartford, Conn.-based conglomerate that had $27.9 billion in revenue last year, also wouldn't comment.

But the CSC technician said the two companies appear to be engaged in a game of financial brinkmanship. "They cannot agree on the money, and neither side is willing to back down," he said. "It's like [CSC officials] wanted the contract so bad, and now they may not be able to live up to it."

Another person close to the situation said it isn't so much that CSC underbid the original contract. The issue, he said, is that the outsourcing vendor hasn't fully achieved expected savings in operating costs by consolidating UTC's IT facilities and automating functions such as data backup and remote PC management.

Peter Bendor-Samuel, president and CEO of Everest Group Inc., a Dallas-based outsourcing consulting company, said he's familiar with the current friction between UTC and CSC. Bendor-Samuel said such disagreements are common on deals that result from highly competitive bidding processes.

"The investment banking term for this is *the winner's curse*," he said. "It was a fiercely competitive deal. [For UTC] it was go at it and drive down the price through bidding. That then put them in this death spiral when CSC made some bad assumptions."

The contract was initially signed in May 1999 as a 10-year, $1.2 billion deal between El Segundo, Calif.-based CSC and UTC's Pratt & Whitney aircraft engines subsidiary. The agreement was expanded that fall to cover all of UTC's North American IT infrastructure and was extended by another five years last November.

As part of the contract, CSC is standardizing about 45,000 PCs throughout UTC's operations, adding new IT management software and consolidating the company's data centers, servers and help desk operations (see box).

During an interview in June, UTC CIO John Doucette emphasized that it was CTC's responsibility to spend money on technology, such as Veritas Software Corp.'s NetBackup tool, in an attempt to further automate UTC's operations and "thus reduce cost."

Bendor-Samuel said one or two outsourcing megadeals end up in similar situations each year because it's nearly impossible to predict the long-term costs of technology and IT services. But the vast majority of conflicts are resolved before deals fall apart, he added.

"The cost of failure here is too great for both companies," Bendor-Samuel said. "What often has to happen is they have to play out the emotion before [a resolution] can happen." ◗

Outsourcing Details

UTC's contract with CSC includes the following:

CONSOLIDATING 20 major data centers into three facilities

STANDARDIZING about 45,000 PCs on common Dell technology

ELIMINATING about 350 of UTC's 2,950 servers

COMBINING 15 help desks running nine applications into one operation with a single system

STANDARDIZING network management on Computer Associates' Unicenter TNG software

IMPLEMENTING Veritas Software's data backup software at all data centers

Windows Desktop OS Life Cycle Support

WINDOWS VERSION	END DATE STANDARD SUPPORT	END DATE QUICK FIX ENGINEERING
Windows 95		
Windows 98		
Windows NT 4.0		

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FRANK HAYES • FRANKLY SPEAKING

Florida's New Chad

LAST TUESDAY THEY HELD a primary election in Florida. You remember Florida — land of swaying palms and hanging chads in the 2000 U.S. presidential election. Almost two years and $32 million later, the election snafus were all supposed to be gone, replaced by state-of-the-art touch-screen voting systems in some counties and high-tech optical scanners for vote counting in others. They were supposed to guarantee an election that voters could trust.

And the results are in: Wrongheaded human nature easily trounced supposedly foolproof technology. It wasn't even close.

What went wrong? In many parts of the state, nothing. But according to news reports, where they had technology-related problems, boy, did they have problems.

- In Miami's Dade County, hundreds of voting machines still weren't working hours after polls opened at 7 a.m. In many cases, poll workers had simply failed to turn on the voting machines properly. Some never started at all; others appeared to work but quickly crashed.
- In Jacksonville's Duval County, some polling places opened late because poll workers didn't even realize they were supposed to turn on the machines themselves.
- In Orlando's Orange County, 42% of the votes were counted by hand because ballots tore as they were fed into optical scanners.
- In Union County in northeastern Florida, all votes had to be hand-counted because the county's optical scanners somehow registered every vote cast as being for a Republican.
- In Fort Lauderdale's Broward County, along with other problems, several modems that were supposed to transmit precinct results failed. In the confusion that followed, sheriff's deputies haphazardly piled up hundreds of data cartridges from polling places at the central voter equipment warehouse. By early Wednesday morning, cartridges with the results from six precincts were still missing.

And across the state, after the problems prompted Gov. Jeb Bush to keep polling places open for two extra hours, poll workers discovered that once the electronic voting machines were turned off, they couldn't be turned on again — and in many precincts, paper ballots used as a backup system ran out.

Sometimes it was the technology that failed. Sometimes it was a training problem. Or inadequate backup systems. Or failure to test the equipment and procedures in advance. Or the lack of a Plan B when things went wrong.

But most of the problems stemmed from one basic flaw: Election officials trusted in the technology.

And the more trust they had, the more likely things were to go wrong.

In places where mock election run-throughs were held in advance, there were far fewer problems, and they were dealt with more effectively. In counties that spent more hours training workers to operate the computerized equipment, there were fewer breakdowns.

Predictable? Sure. Dry runs turn up problems that can be fixed or worked around. Better training cuts the likelihood of problems. All IT people know that. Every technology rollout goes more smoothly when it's done with those undeniable realities in mind.

But before anyone gets too smug, remember: IT people trust technology too.

We believe the hardware we choose will do the job and do it well. We're sure of the software we write and the integration we do. We have confidence in our projects and take pride in our work.

FRANK HAYES, *Computerworld*'s senior news columnist, has covered IT for more than 20 years. Contact him at frank_hayes@computerworld.com.

And all that pride, confidence and trust is fine — so long as we still test our new systems like they were disasters-in-waiting, train our users as if they'll be dealing with unreliable junk and make our contingency plans assuming that everything *will* go wrong.

Because we all want results we can trust.

And the only way to get really trustworthy IT is to never really trust it at all. ◗

Doin' the Bandwidth Boogie

Network manager is fed up with a co-worker who's wasting bandwidth by using Morpheus to download music files. But instead of confronting the offender, he configures the firewall to block Morpheus.com. Pilot fish mentions this to the offender, who laughs. "He just managed to shut down the annoying pop-up ads," offender says. "But the searches and downloads still work great. I should thank him for improving the way Morpheus runs on the network!"

Beefed Up

Project manager pilot fish pushes for a separate ISDN network for this streaming media project, but IT boss says no – use the existing WAN. That lasts until a router fails during a speech by the CIO, killing the CEO's ability to use it. Next day, boss has new orders for fish: "Make the network fully redundant – including a separate ISDN network."

Kicked Off

You need to fix your network, database developer tells sysadmin pilot fish. "It must be brain, because users keep losing connections to the database." After a little work with a network analyzer, fish discovers that the database server just stops responding every so often. And a little further snooping reveals why: This huge database is stopping to reindex itself every time a user logs into it.

Tuned In

Ever since you fixed my PC, my radio doesn't work, remote user complains to IT pilot fish. Your radio? fish asks. "The one on my screen with all the buttons – it's called Real or something." Hmm, wonders fish, could her streaming radio stations be related to our sluggish response time lately no that fire?

Clued Out

After top management demands an end to wasted bandwidth, IT manager pilot fish fields questions from not entirely clued-in users about what things are bandwidth-intensive: "They asked about streaming Net radio," he says. "And streaming movie trailers. And online banking. And audio CDs played through the internal drives . . ."

Logged Off

Pilot fish tweaks and tunes, adds capacity and blocks porn sites, but users still complain that Internet response time is slow. When he starts blocking pay-to-surf and chat sites, things improve – but help desk gets complaints from users having Web trouble. They won't identify the problem sites, but fish checks the logs: "Seems most of the ones with problems could no longer play games at work."

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